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Women in pain : the course and diagnostics of chronic pelvic pain

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Women in PAIN

The course and diagnostics of chronic pelvic pain

Philomeen Weijenborg

Women in pain

The course and diagnostics of chronic pelvic pain

Colofon

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Women in pain

The course and diagnostics of chronic pelvic pain

PROEFSCHRIFT

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door

Philomena Theodora Maria Weijenborg

geboren te Deurne in 1953

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Promotor	Prof. dr. J.B.M.Z. Trimbos Prof. dr. A.A.W. Peters
Co-promotor	Mw. dr. M.M. ter Kuile
Overige leden	Prof. W. Stones, Aga Khan University, Nairobi, Kenia. Mw. prof. dr. M.L. Peters, Maastricht University. Mw. dr. K.T. Zondervan, University of Oxford, Oxford.

Zwemmen is als losbandig slapen in spartelend water,
is liefhebben met elke nog bruikbare porie,
is eindeloos vrij zijn en inwendig zegevieren.

En zwemmen is de eenzaamheid betasten met vingers,
is met armen en benen aloude geheimen vertellen
aan het altijd alles begrijpende water.

Ik moet bekennen dat ik gek ben van het water.
Want in het water adem ik water, in het water
word ik een schepper die zijn schepper omhelst,
en in het water kan men nooit geheel alleen zijn
en toch eenzaam blijven.

Zwemmen is een beetje bijna heilig zijn.

Paul Snoek 1933-1981

Voor Vader, Theodor, Els

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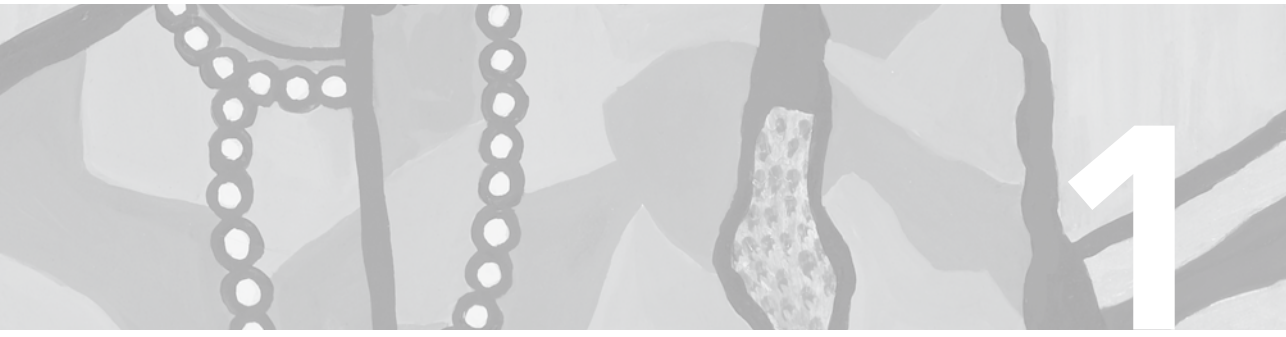
General introduction



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Chronic pelvic pain (CPP) in women is commonly defined as a constant or intermittent pain in the lower abdomen or pelvis with a duration of at least 6 months, not exclusively related to menstrual period (dysmenorrhoea) or sexual intercourse (dyspareunia) [Williams 2004]. As a definition of chronicity in some CPP studies a duration of complaints for 3 months or longer [Merskey 1986] is used.
Community based studies in the US [Mathias 1996], the UK [Zondervan 2001], New Zealand [Grace 2004] and Australia [Pitts 2008] showed variations in prevalence rates for CPP from 15% to 25%, depending on the definition of chronic pelvic pain, the study design and the measurements used. In a study on consulting patterns for CPP in UK primary care, an annual prevalence rate of 3.7% was examined, comparable with figures for asthma (3.8%) and back pain (4.1%) [Zondervan 1999a]. Only 40% of these consulters were referred to secondary or tertiary medical care [Zondervan 1999b]. Therefore, gynaecologists are likely to be confronted with a highly selected subgroup of all CPP women.
The pathogenesis of CPP is poorly understood. Clinical assessment requires history taking, physical examination with further investigations like laboratory tests, ultrasound scanning, Computed Tomography (CT) or Magnetic Resonance Imaging (MRI). In gynaecological practice endometriosis and/or adhesions are thought to be the most prevalent explanations for pain in the pelvic region. To diagnose this pathology performing laparoscopy is considered an essential tool. However, in about 40% of the laparoscopies in women with CPP no obvious cause for the pain complaint can be demonstrated [Howard 1993]. If an abnormality is observed the association between pathology and the site or severity of the pain is poor [Hammoud 2004; Fauconnier 2005; Vercellini 2007]. To make it worse, the same type of pathology is also noted in pain free women [Howard 1993]. Consequently, laparoscopic findings are considered to be coincidental rather than causal.
Suffering from CPP can impact on the physical and mental health of the affected women resulting in an impaired quality of life [Stones 2000] with for instance higher levels of anxiety, depression and sexual problems in comparison with pain free controls [McGowan 1998; Grace 2006, ter Kuile 2009]. Furthermore, studies on CPP women show that the rate of physical and especially sexual abuse in these women's histories is elevated compared to pain free controls [Roelofs 2007].
In addition, the range of effective interventions remains limited and recommendations for treatment are based on single studies [Stones 2005].

Outline of the thesis

The studies presented in this thesis aim to gain further insight into (a) the reliability of the evaluation of findings during videotaped laparoscopic assessment, (b) sexual functioning in women with CPP and (c) the clinical course of pain in women with acute abdominal and chronic pelvic pain. Finally, we describe a model that can be used in clinical practice for the assessment of women with CPP. The studies are described in detail in the following chapters, but their aims are summarized in this general introduction.

Setting

All current study participants suffering from CPP have been referred by a gynaecologist of the outpatient clinic of the department of Gynaecology of the Leiden University Medical Center (LUMC) to the so called Chronic Pelvic Pain team (CPP-team), as introduced by Peters [Peters 1991]. Gradually, the team is regarded as an expert center for women with CPP and provides local secondary and regional tertiary care.

The reliability of videotaped laparoscopic findings

At present the use of laparoscopy increases for diagnostic and therapeutic reasons. To record the findings during laparoscopy, videotaping of this procedure has been introduced. Gradually, videotaped laparoscopies have found general acceptance for the following reasons: residential training, informing the patient on the findings, requesting second opinions and malpractice procedures. For all of these uses it is a prerequisite that evaluations of videotaped laparoscopies are consistent with real-time laparoscopic findings, the so-called "gold standard". In *chapter 2* we investigate the intra- and interobserver reliability of evaluations by assessors who view videotaped laparoscopies compared with real-time laparoscopies in a sample of a heterogeneous population of women with endometriosis and/or adhesions or without disease.

Sexual functioning of CPP women

Sexual dysfunctions can result from the somatic and/or psychological factors associated with chronic pelvic pain. In *chapter 3* we examine differences in the number and type of sexual problems in a clinical sample of women with CPP compared to healthy controls. We also determine whether the association between CPP and sexual problems is moderated or mediated by somatic and psychological factors as manifested in these women. Moderators are baseline variables (qualitative or quantitative) that affect the direction and/or strength of the relation between CPP and sexual problems. Mediators are variables that (partly) explain the observed relationship between CPP and sexual functioning.

The course of abdominal and pelvic pain in women

First, we concentrate on the clinical course of *acute* abdominal pain (i.e., pain in the abdomen of less than 1 week's duration). Because we want to know to what extent women still report pain complaints following an acute episode of abdominal pain, we conduct a 2 years' follow-up study on a cohort of women who have visited an emergency department of a secondary care hospital for acute abdominal pain (*chapter 4*). Also, we analyse whether pain persistence in this cohort is associated with demographic and clinical variables. Knowing risk factors for persistence of pain may lead to early identification of patients at risk for the development of chronic pain after an acute episode and, through early and appropriate intervention, reduce this risk [White 1997].

Second, in the next 2 chapters we investigate the clinical course of *chronic* pelvic pain. In *chapter 5* we follow a cohort of women with CPP, and assess recovery from CPP at a 3 years' period on average. We also examine changes in pelvic pain severity and psychological distress. Factors associated with recovery from pain are identified. In clinical practice, knowledge about the clinical course of CPP and the risks for chronicity, can be of great value [Croft 2006] in order to give a woman with CPP a realistic expectation about the course and prognosis of her condition. From studies in other chronic pain conditions, evidence emerges which suggests that besides somatic factors, psychological aspects like pain appraisals (i.e., attributions and expectancies about pain) and cognitive pain coping strategies can play a prominent role in the course of these complaints [Turk 2004]. Therefore, a second follow-up study of a new cohort of CPP women has been conducted (*chapter 6*). We focus not only on recovery from pain and changes in pain severity but also on changes in adjustment to pain (i.e., anxiety, depressive symptoms and health related quality of life) as well as on changes in pain appraisals and coping strategies. Furthermore, we evaluate whether pain appraisals and pain coping at baseline and their changes from baseline are associated with improvement in the long term.

Assessment

In *chapter 7*, considering the results of the observational studies, we suggest a structured method that can be used in history taking of women suffering from CPP to facilitate women's motivation for pain management that intends to alleviate pain and improve adjustment to pain.

Summary

Chapter 8 summarizes and recapitulates the results of the studies presented in this thesis in terms of the research questions of these studies. The limitations of the studies and the implications of the results for clinical practice and future research are discussed.

Women in
PAIN

Adapted from Fertil Steril 2007;87:373-80

Intraobserver and interobserver reliability of videotaped laparoscopy evaluations for endometriosis and adhesions

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Philomeen Weijenborg, Moniek ter Kuile and Frank Willem Jansen.

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ABSTRACT

Objective: To determine the intra- and interobserver reliability of evaluations during videotaped laparoscopy, with real-time laparoscopy as the "gold standard."
Design: Prospective evaluation.
Setting: University hospital.
Patients: Women who underwent laparoscopy for chronic pelvic pain, sterilization, or infertility workup.
Intervention: Real-time laparoscopies were videotaped and scored, then later reassessed.
Main Outcome Measure: Intra- and interobserver levels of agreement between evaluations for endometriosis and adhesions.
Results: With the use of reassessments on 90 (videotaped) laparoscopies, the intra- and interobserver levels of agreement between the scorings for endometriosis were found to be substantial, except for ovarian implantations. A high agreement was found in the staging of endometriotic disease. The intra- and interobserver levels of agreement for scoring adhesions were only fair to moderate, and a substantial number of differences between measurements in adhesion total scores was found. No systematic difference between the number of disagreements was observed in either setting.
Conclusions: Although special attention has to be given to the assessments of ovarian lesions, the evaluations of videotaped laparoscopies for endometriosis were reliable and justified the use of recorded findings. Because evaluations of adhesions during videotaped laparoscopy are not reliable, in some cases a second laparoscopy may need to be performed.

Introduction

Performing laparoscopy is a common tool for gynecologists in the case of diagnostic or therapeutic procedures. To record the findings, videotaping of this procedure has been introduced. Gradually, videotaped laparoscopies found general acceptance for residential training, informing the patient of the findings, and requesting second opinions. Video recordings have also been introduced as evidence both for and against the operator in medical malpractice proceedings [Corson 1995]. In these circumstances, it is a prerequisite that evaluations of videotaped laparoscopies are consistent with real-time laparoscopic findings, the so-called "gold standard."
In a study by Bowman [Bowman 1995], scorings of adnexal adhesions during real-time laparoscopy in women who had been diagnosed previously with adhesions were compared with assessments of videotaped laparoscopies by 2 separate assessors. A large variation in adhesion scorings between 2 of the 3 observers and a poor level of agreement on subdivisions of adhesion total scores were reported.
In another study by Corson [Corson 1995], comparisons were made between scorings by 1 operating surgeon during real-time laparoscopies of women who were diagnosed with adhesions and reassessments of videotaped laparoscopies by 4 separate observers, before adhesiolysis, at second look, and 4 months later. An acceptable intra- and interobserver variability in scoring laparoscopic diagnosis of pelvic adhesions was found.

The reproducibility of the revised American Fertility Society classification for endometriosis was evaluated [Hornstein 1993]. When 5 assessors reviewed videotaped laparoscopies of patients with endometriosis twice, an acceptable agreement between the peritoneal scores was observed. However, great variability in the ovarian endometriosis and cul-de-sac components of the classification was also found.
Rock [Rock 1995] found a fair level of agreement between assignments of the endometriotic disease stage by 22 surgeons who scored real-time laparoscopies of women with endometriosis and 1 blinded assessor who reviewed visual documentation.
Recently, Buchweitz [Buchweitz 2005] evaluated the interobserver variability in the diagnosis of minimal and mild endometriosis. A digital videotape of 3 patients (1 patient with stage I endometriosis, 1 patient with stage II endometriosis and 1 patient without endometriosis) was presented to 108 gynecologists. In this study, the number and location of the endometriotic lesions varied substantially between the observers, and a correct classification of the endometriotic disease stages I and II was found in only 22% and 13% of the cases, respectively.

All of these reliability studies, with the exception of the last one, were performed in selected populations (i.e., women previously diagnosed with adhesions or endometriosis). Further, in most studies, assessors were informed of the clinical history, complaints, and/or treatment of the patients. Although it is acknowledged that the accuracy of a diagnostic test increases with increased prevalence of the target condition and with the provision of

clinical information [Whiting 2004], no studies have been conducted in a more general population, with totally "blinded" assessors.

Therefore, the main purpose of the present study was to investigate intra- and interobserver reliability of evaluations by assessors,/ who viewed videotaped laparoscopies compared with real-time laparoscopies in a sample of a heterogeneous population of women with endometriosis and/or adhesions or without disease. Clinical information would be available only for the operating surgeon and not for the assessors, who also were blinded to one another's measurements. In this way, we expected to determine the level of agreement between measurements in both the intra- and interobserver settings of scoring the presence or absence of endometriosis and adhesions and scoring the severity and extent of the disease.

Material and Methods

Consecutive women from a gynecologic outpatient clinic of a university hospital for whom a diagnostic laparoscopy was indicated for chronic pelvic pain (CPP), sterilization, or infertility workup (FER) were invited to participate in the study.
The procedure of the laparoscopy was standardized. A 2-trocar double puncture technique was used. All laparoscopies were performed with the use of general anesthesia in the same operating theatre, and all procedures were videotaped. The operating surgeons and the team of nurses were instructed to use the same standardized procedure regarding which specific structures were to be recorded to obtain a detailed view of the pelvis and abdominal cavity. Recording had to be finished before any surgical intervention was started. In this way, only the diagnostic part of the laparoscopy procedure was videotaped.

The findings on viewing real-time and videotaped laparoscopies were both scored on a sheet that had been designed especially for this study.

Endometriosis

The assessor had to mark whether endometriosis was present, absent, or not to be determined. The scoring sheet of the revised classification of endometriosis of the American Fertility Society was used to assess the severity and location of endometriosis, which resulted in a total score (range 0-60). The stages of the disease that were calculated from the total score are defined as Stage I (minimal; score 1-5), Stage II (mild; score 6-15), Stage III (moderate; score 16-40) and Stage IV (severe; score, >40) [Revised AFS Classification 1985].

Adhesions

The assessor had to mark whether adhesions were present, absent, or not to be determined. A scoring form was used to assess the severity (16 sites) and extent (11 sites) of the

adhesions, both pelvic and abdominal [Mage 2000]. The total adhesion score (range 0-97) was calculated as described by the Adhesion Scoring Group [Adhesion Scoring Group 1994].

Quality of the Videotaped Laparoscopy

To score the quality of the videotape, a visual analogue scale of 10 cm was used (range 0 = very bad to 10 = excellent).

The Institutional Review Board of the Leiden University Medical Center approved this prospectively designed evaluation of scorings by gynecologists during real-time and videotaped laparoscopies. All patients who participated in this study gave their informed consent.

Evaluation of Videotaped Laparoscopies

To determine the intraobserver reliability of the videotaped evaluations, the level of agreement between measurements by the same surgeon during real-time and videotaped laparoscopy was obtained. To determine the interobserver reliability, the level of agreement between measurements by 2 different observers who scored the same videotaped laparoscopy was used.

Each operating surgeon assessed a sample of his own videotaped laparoscopies and those of his colleagues. Appointments to look at the videotapes were made by a research assistant. Each tape was viewed in total. On request, the observer was permitted to review a portion of the tape for clarification. To prevent fatigue, scores were made for a maximum of 1 hour or 10 videotapes per session. During video assessment, the gynecologists and the research assistant were unaware of the clinical history of the patient, the indication for the operation, or the name and scores of the original operating surgeon. We deliberately made the choice to ask only surgeons from the same hospital and department to participate in the study to avoid a source of bias that could be caused by differences in expertise and policy of every day practice between medical centers.

A sample was taken at random from the original videotaped laparoscopies, with the use of the randomization function of the Statistical Package for Social Sciences (version 11.0; SPSS Inc., Chicago, IL). The distribution of women who underwent laparoscopy because of chronic pelvic pain, sterilization, or FER in the original sample was preserved.

The number of laparoscopies that were performed by each operating surgeon varied between 4 and 35 procedures. In the event that the operating surgeon had made >10 videotapes, a random sample of 10 was drawn from his own tapes. Surgeons who made <10 videotapes kept his/her own videotapes to assess; the total amount of videotapes was upgraded to 10 by taking, at random, videotapes from those surgeons, who had originally made >10 tapes. To obtain a total number of 20 videotapes for assessment, the remaining 10 tapes were allocated at random to each assessor. The sequence of the videotapes that were presented for scoring was also at random.

Statistical Analysis

Kappa (κ) statistics were used to determine the level of agreement between 2 measurements or observers on a categoric scale (i.e., the finding [yes or no] for endometriosis,adhesions, and the stages of endometriotic disease). With κ statistics, the amount of agreement between a pair of observations, over and above what is expected by chance alone, is calculated. When κ equals 1, perfect agreement is implied; whereas when κ equals 0, the agreement is no better than that which would be obtained by chance. Landis and Koch [Landis 1977] have given an indication of judging intermediate values. For most purposes $\kappa \leq 0.20$ represents poor agreement; values between $0.21 \leq \kappa \leq 0.40$ represent fair agreement; values between $0.41 \leq \kappa \leq 0.60$ represent moderate agreement; values between $0.61 \leq \kappa \leq 0.80$ represent substantial agreement, and a value of $\kappa > 0.80$ indicates good agreement. McNemar tests were used to estimate the probability of a systematic difference between the number of disagreements.

To determine the level of agreement between measurements on a continuous scale (such as in case of total scores for endometriosis and adhesions), Bland Altman plots [Bland 1986; Khan 2001] were constructed. The difference against the mean of the measurements for each subject in the study is used. If the average difference is 0, no bias in results is inferred, which implies that on average the duplicate readings agree.
The British Standards Institution repeatability coefficient, by definition 2 times the SD of the mean of the differences, indicates the maximum difference that is likely to occur between 2 measurements. It provides a measure of agreement and can be used as a comparative tool. The range that encompasses 95% of the differences between measurements ($d \pm 2$ SD) is limited by the so-called upper and lower limits of agreement.

Finally, with *t*-tests for independent samples, the effect of the quality of the videotapes on the scores for endometriosis and adhesions was evaluated.

Results

One hundred fifty-one laparoscopies were performed and recorded on videotape by or under the supervision of 9 senior gynecologists of the Department of Gynecology, Leiden University Medical Center. For 11 of the total number of tapes (7%), the name of the gynecologic supervisor was not indicated in the records. Only reassessments of videotapedlaparoscopies that had been scored by gynecologic staff members as operating surgeon or supervisor could be used; therefore, these 11 tapes had to be excluded. From theremaining 140 laparoscopies, a final research sample of 90 (videotaped) laparoscopies was constructed.

In this sample, endometriosis was found only in the FER group, in 53% of the cases. Adhesions were seen in 66% of the cases in the chronic pelvic pain group and in approximately

one half of the cases in the sterilization and FER group. In 10 cases of the FER group (19%), adhesions and endometriosis were found. Twenty-four laparoscopies (27% of all cases) did not show any endometriosis or adhesions.

The time span between the last recording and the first assessment was at least 8 months. Thorough viewing of 1 tape took an average of 5 minutes (range 4-7 minutes). In total 56 (videotaped) laparoscopies could be used to determine the intraobserver reliability; 90 videotapes could be used to obtain the interobserver reliability. However, on analysis, the total numbers turned out to be less because in 8 of the 180 cases, reassessments were impossible. Diverse reasons were mentioned (for instance, the videotape was too dark, the view was hampered by adhesions, or the observer was unable to give a scoring because palpation of the lesion was not possible). In only 1 case could a videotape not be assessed because of technical problems.

Intraobserver Reliability

As illustrated in Table 1, the level of agreement between the scorings (present or absent) for endometriosis that were made by the operating surgeon during real-time laparoscopy and videotaped laparoscopy was substantial ($\kappa = 0.75$), whereas for adhesions the level of agreement was fair ($\kappa = 0.38$).

McNemars tests indicated no systematic difference between the number of disagreements, which indicated that disagreements were distributed equally among the evaluations made during real-time and videotaped laparoscopy. For scoring endometriosis, however, a trend towards a systematic difference in disagreements was found ($p = .06$) in the direction of the videotaped laparoscopy. The operating surgeon who viewed his videotaped laparoscopy was more often inclined systematically to score the presence of endometriosis in cases on which he scored "no endometriosis" during real-time laparoscopy.

Table 1 *Intraobserver level of agreement for the presence or absence of endometriosis and adhesions*

	Videotaped laparoscopy				
Real-time laparoscopy	**Yes**	**No**	**Kappa (κ)**	**95% CI**	**McNemar (*p*-value)**
Endometriosis (52)[a]					
Yes	11		0.75	0.55-0.95	0.06
No	5	36			
Adhesions (55)[a]					
Yes	21	8	0.38	0.13-0.63	1.00
No	9	17			

Values are number of videotapes. [a] in parenthesis: total number of videotapes.

In 87% of the repeated measurements, the surgeons agreed on the stage of endometriotic disease (Table 2). In 5 cases (10%), a difference of 1 stage was observed. In 2 cases (3%), a difference of 2 stages occurred that was caused by a marked difference in endometriosis total scores. Both surgeons who viewed the videotaped laparoscopy scored "deep endometriosis in the ovary," which corresponded with a total score of 16 or 20, whereas during real-time laparoscopy they indicated a superficial ovarian lesion corresponding with a score of 4.

Table 2 *Intraobserver level of agreement for stage of endometriosis*

	Videotaped laparoscopy			
Real-time laparoscopy	**No endometriosis**	**Stage I**	**Stage III**	**Total**
No endometriosis	36	5		41
Stage I		9	2	11
Total	36	14	2	52

Values are number of videotapes.

The level of agreement between the measurements for the severity and extent of endometriosis and adhesions was indicated in Bland Altman plots (Figs. 1 and 2). Because 0 was found in the 95% confidence interval (CI) of the mean of the differences for endometriosis total scores (score - 0.9; 95% CI - 1.9; 0.6) and for adhesion total scores (score - 0.3; 95% CI - 0.7; 0.01), it was inferred that, between the 2 measurements, no bias had occurred. Surgeons who assessed their own videotaped laparoscopies did not score systematically higher or lower than when they scored their real-time laparoscopies.
The repeatability coefficient for endometriosis total scores was 7.2, whereas for the adhesion total scores it was 4.8. In case of endometrioses total scores for 41 of the 52 cases the differences in total scores counted 0. For 9 cases the counts for the differences were found within the limits of agreement (- 8; 6). The 2 outlying differences in the FER group resulted from the substantial difference in total scores for deep and superficial ovarian endometriosis.

The total adhesion score could be calculated for only 48 of the 56 videotaped laparoscopies (86%). In 2 cases, assessment of the severity and extent of the adhesions was impossible because of insufficient viewing material and doubts about the diagnosis. In 6 other cases, the type and/or extent of the adhesion was not indicated on the scoring form. Twenty-three differences (48%) counted 0, whereas another 23 differences (48%) had counts within the limits of agreement (- 5; 4.5). Both cases in which the limits of agreement were exceeded, 1 case in the chronic pelvic pain and the other case in the FER group, resulted from a lower score during real-time than during videotaped laparoscopy without a clear reason.

Figure 1 *The mean against the difference of each endometriosis total score in the intrarater condition (n=52)*

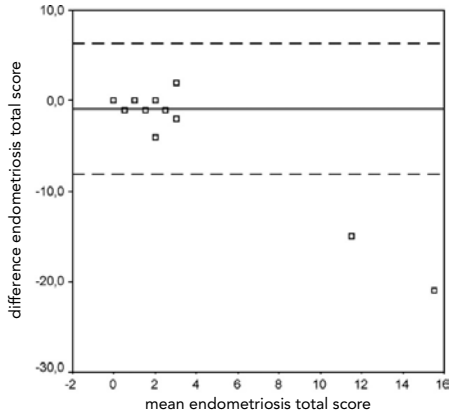
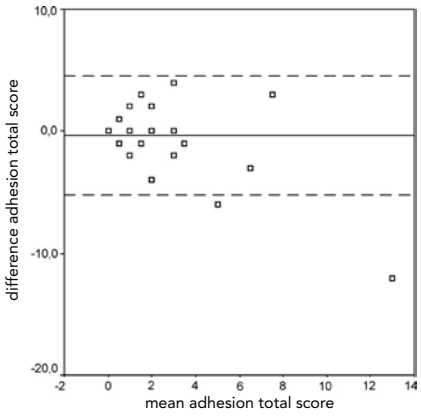


Figure 2 *The mean against the difference of each adhesion total score in the intrarater condition (n=48)*



Interobserver Reliability

As can be seen in Table 3, the level of agreement between the scorings (present or absent) for endometriosis by raters A and B was substantial ($\kappa = 0.75$), whereas for adhesions the level of agreement was moderate ($\kappa = 0.55$). As McNemars tests indicated, no systematic differences between the number of disagreements for the 2 raters were found, which indicated that the disagreements were distributed equally among evaluations by raters A and B.

Table 3 *Interobserver level of agreement for the presence or absence of endometriosis and adhesions*

	Rater B				
Rater A	**Yes**	**No**	**Kappa (κ)**	**95% CI**	**McNemar (*p*-value)**
Endometriosis (83)[a]					
Yes	27	4	0.75	0.59-0.89	0.75
No	6	46			
Adhesions (88)a					
Yes	35	13	0.55	0.39-0.72	0.26
No	7	33			

Values are number of videotapes. [a] in parenthesis: total number of videotapes.

In 80% of the repeated measurements, both raters A and B agreed on the stage of the endometriotic disease that they assigned (Table 4). In 17 cases (20%), a difference of 1 stage was found ($\kappa = 0.59$; 95% CI 0.43; 0.75).

Table 4 *Inter-observer level of agreement for stage of endometriosis*

	Rater B				
Rater A	**No endometriosis**	**Stage I**	**Stage II**	**Stage III**	**Total**
No endometriosis	46	6			52
Stage I	6	19	2		27
Stage II		2		1	3
Stage III				1	1
Total	52	27	2	2	83

Values are number of videotapes.

Bland Altman graphs were constructed for the endometriosis and adhesion total scores (Figs. 3 and 4). Because 0 was found in the 95% CI of the mean of the differences for endometriosis total scores (score 0.25; 95% CI - 0.25; 0.75) and for adhesion total scores (score - 0.03; 95% CI - 0.59; 0.53), it was inferred that no bias was found between the measurements of raters A and B. Raters A did not score systematically higher or lower than raters B when they scored videotaped laparoscopies. The repeatability coefficient for endometriosis and adhesion total scores was 4.6.

In the case of endometriosis total scores, 65 of 83 differences (67%) counted 0, whereas the other 25 differences (30%) were found to be within the limits of agreement (- 4.4; 4.9). One substantial difference of 16 was found in the FER group, because rater A scored deep ovarian lesion, whereas rater B did not indicate an ovarian lesion at all.

The total adhesion score could be calculated for only 65 scorings of the 90 videotaped laparoscopies (72%). In 1 case, the severity of the adhesions was not indicated; in 4 other cases, proper assessment of the tape was not possible because of insufficient lighting or complete lack of view. In the other 20 cases, 1 or both assessors did not indicate the extent of the adhesion on the scoring form. The reason for this omission was unclear: either the assessor forgot to fill in the score on the form, or the assessor was not able to give a score. For 39 of the 65 tapes (60%), the difference in total scores was found to be 0. The remaining 25 values of the differences (38%) were found to lie between the limits of agreement (- 6.3; 6.8). One outlier was found in the FER group (score - 12) that was caused by a substantial difference in the scores of adhesions between rater A and B without a clear reason.

Figure 3 *The mean against the difference of each endometriosis total score in the interrater condition (n=83)*

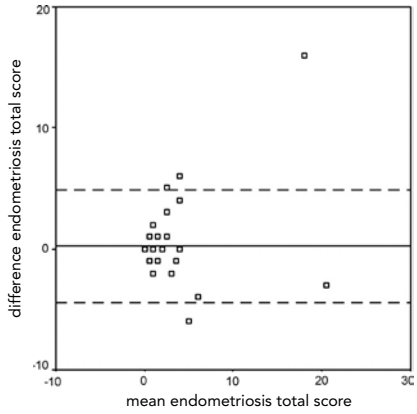
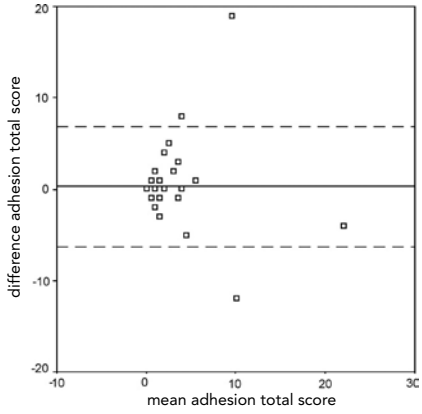


Figure 4 *The mean against the difference of each adhesion total score in the interrater condition (n=65)*



Quality of the Videotape

When surgeons scored their own videotaped laparoscopy, the mean (± SD) of the quality scores was 6.5 ± 2.7. When both observers scored the same videotaped laparoscopy, no significant difference (t (88) = 0.13; p = 0.9) was found between the mean of the quality assessment by raters A (mean 6.3 ± 2.6) and that of raters B (mean 6.2 ± 2.6). We observed that the intra- and interobserver level of agreement in scoring endometriosis or adhesions was not related to the quality score of the videotaped laparoscopy as assessed by the observers.

Discussion

In this study we investigated the intra- and interobserver reliability of evaluations based on videotaped laparoscopies, although that of the real-time laparoscopy was considered as the "gold standard."

There were 3 major findings. First, in both the intra- and interobserver settings, a substantial level of agreement was found between the scorings regarding the presence or absence of endometriosis and for the stages of endometriotic disease. Second, we observed a level of agreement of fair to moderate regarding the presence or absence of adhesions in the intra- and interobserver setting, respectively. Last, disagreements between measurements were distributed equally between both settings.

When comparing our findings with those of previous studies [Hornstein 1993; Corson 1995; Bowman 1995; Rock 1995; Buchweitz 2005], it is important to realize that there are many differences in design, sample and measurement. For example, in contrast to others, our aim was to evaluate the intra- and interobserver reliability of the videotaped evaluations, we used a heterogeneous population of women with endometriosis and/or adhesions or without disease, and our assessors were blinded for clinical information and one another's measurements. Despite these differences, some of the similarities between the pattern of results that were obtained in the present and previous studies are worth mentioning.

Regarding the presence or absence of endometriosis, our findings were partly in line with the results of a recent study by Buchweitz [Buchweitz 2005]. We found that, in 90% of the cases, the assessors who scored a videotaped laparoscopy agreed with their findings during the corresponding real-time laparoscopy. Although Buchweitz did not give an overall agreement, 94% of the assessors in this study agreed at reassessment of 2 videos of patients with endometriosis, whereas approximately one half of the raters disagreed when they saw an endometriotic lesion at the moment they assessed a videotape of a patient without endometriosis. The author suggested that this number of disagreements could be explained by the fact that some observers probably scored the presence of endometriosis to a higher rate compared with "normal conditions," because the study took place during a workshop on endometriosis. We also found that an assessor who viewed his own videotaped laparoscopy was more often inclined systematically to see endometriosis in cases in which he scored "no endometriosis" during real-time laparoscopy, although in our study clinical information was not provided.

In line with previous studies [Hornstein 1993; Rock 1995], we found a good reproducibility of the total scores for endometriosis and of endometriotic disease stage. Additionally, a large difference in total scores was also observed in our study when raters disagreed on ovarian implantations, which resulted in disagreement on the stage of the disease. In 2 cases of the intraobserver setting, a change from stage I to stage III was observed because the assessors of a videotaped laparoscopy scored deep endometriosis in the ovary, whereas the surgeon indicated a superficial ovarian lesion during real time laparoscopy. In another 22 cases, a change of 1 stage was found. The clinical relevance and implication of these results depend on the main complaint of endometriosis-related pain or infertility. A variety of treatments are recommended, from nonsteroidal anti-inflammatory agents to hormonal treatment and surgical intervention [Kennedy 2005].

Because the level of agreement on scoring the presence or absence of adhesions was just fair to moderate, we were not surprised to find a substantial number of disagreements between the measurements of the adhesion total scores in both the intra- and interobserver setting. In line with results of a previous study [Bowman 1995] in which a poor level of agreement between the subdivided American Fertility Society scores was found, we had to

conclude that obtaining consistency between measurements on adhesion scoring during real-time and videotaped laparoscopy proved to be difficult.
Bowman [Bowman 1995] suggested that varying scores between observers could result from the fact that video images would not allow an observer to inspect an organ or pelvic area in detail. Some others [Hornstein 1993; Corson 1995] also proposed that variation between evaluations could be explained partly by the benefit of the surgeon knowing the patient's history. Although our study was not designed to do research on this subject, our results were not supportive of these suggestions. We found that surgeons assessing their own videotaped laparoscopy did not score systematically higher or lower than when they scored their real-time laparoscopies. Therefore, during real-time laparoscopy scoring, the surgeons seemed not to be biased by knowing patients' history. These and other factors such as the complexity of the adhesion scoring system could explain the adhesion scoring problem.

The external validity of our results is limited by the fact that we deliberately asked gynecologists from the same hospital and department to be assessors. We therefore suggest further research to explore the reliability of videotaped laparoscopy evaluations for endometriosis by a group of assessors from another medical center. However, because we found a poor level of agreement between the adhesions scorings, first of all studies are required to improve internal consistency of these evaluations.

In conclusion, for endometriosis, the use of videotaped laparoscopies seems to be justified because evaluations during (videotaped) laparoscopies proved to be reliable. Special attention must be given to the assessments of ovarian lesions because observers tend to disagree on the severity and extent of the endometriotic disease, which results in disagreements on the stage of the disease with therapeutic consequences. Regarding adhesions, the evaluations during videotaped laparoscopy were not reliable. These findings indicate that, in the case of adhesions, evaluations during videotaped laparoscopies should be interpreted with caution. Therefore, in court or when second opinions are requested regarding infertility or patients with chronic pelvic pain, one cannot rely on videotaped findings only. If advice on any therapeutic consequences is warranted, repeated surgery (i.e., diagnostic laparoscopy) may be necessary.

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Women in
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Sexual functioning in women with chronic pelvic pain: the role of anxiety and depression

3

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3

ABSTRACT

Introduction: Chronic Pelvic Pain (CPP) in women is a long-lasting and often disabling condition. It seems reasonable to expect that as a result of the pain, extreme fatigue and/or depressive mood, women with CPP may report a variety of sexual problems.
Aim: The present study investigated differences in the report of sexual problems in women with Chronic Pelvic Pain (CPP) compared to healthy controls, and whether the association of CPP with sexual problems was moderated or mediated by somatic and psychological factors as manifested in women suffering from CPP.
Method: 154 women with CPP and 58 age-matched controls completed self-report measures for sexual functioning, pain, physical impairment, anxiety, depression, sexual and physical abuse.
Main Outcome Measure: Golombok Rust Inventory of Sexual Satisfaction (GRISS).
Results: Women with CPP reported higher levels of vaginistic complaints, sexual avoidance, nonsensuality and sexual dissatisfaction than healthy controls. Sexual problems were associated with anxiety, depression and sexual abuse history but not with somatic factors as pain and physical impairment. Anxiety as well as depression, irrespective of the report of sexual abuse experiences, mediated the effect of CPP on sexual problems. Sexual abuse was a general predictor of sexual problems in both women with CPP and controls.
Conclusions: Anxiety and depression constitute important factors in the evaluation of sexual problems in women with CPP.

Introduction

Chronic pelvic pain (CPP) in women is described as a continuous or intermittent pain, in the lower abdominal area or pelvis for at least six months, not exclusively associated with the menstrual cycle (dysmenorrhoea) and/or sexual intercourse (deep dyspareunia) [Williams 2004]. Chronic pelvic pain is a long-lasting and often disabling condition [Mathias 1996]. Problems with sexual functioning resulting from chronic pelvic pain have to be addressed and assessed by the health care professional. It seems reasonable to expect that as a result of the pain, extreme fatigue and/or depressive mood, women may report a variety of sexual problems ranging from decreased pleasure and frequency of intercourse, deficient lubrication during sexual contact, superficial or deep dyspareunia and/or problems in reaching orgasm to a total aversion towards sexual intimacy.

Reports in the literature about the coincidental prevalence of sexual problems with CPP are scarce. In community based studies in the UK [Zondervan 2001], New Zealand [Grace 2004] and Australia [Pitts 2008] a substantially larger proportion of the women with CPP reported dyspareunia (varying between 29% and 42%) than women without CPP (varying between 11% and 14%). Only a few studies have investigated sexual problems within clinical populations [Collett 1998; Verit 2006; Florido 2008]. In line with the results of the community based studies, patients with CPP reported more sexual problems such as dyspareunia, problems with desire or arousal and lubrication than women without CPP [Collett 1998; Verit 2006; Florido 2008]. Collett and colleagues also found that patients with CPP reported more sexual problems than women with any other type of chronic pain problem.

The available studies suggest that women with CPP report more frequently a history of sexual abuse [Roelofs 2007] and show higher levels of anxiety and depression [McGowan 1998] compared to controls. Moreover, there are indications that a history of sexual abuse [Leonard 2002] as well as higher levels of anxiety and depression [Angst 1998] are both related with sexual problems. Therefore the possible differences in sexual functioning between women with CPP and controls as found may be mediated and moderated by these factors. In line with this supposition, Randolph and Reddy [Randolph 2006] found that in a non-clinical sample of 63 women with CPP, sexual problems were positively related to a history of sexual abuse and depression. The effect of sexual abuse on sexual functioning was dependent on the extent of depressive symptoms. Therefore, differences in sexual functioning between women with CPP and controls might be mediated by pain characteristics (somatic and psychological factors) and moderated by patient characteristics such as a history of sexual abuse.

The purpose of the current study was to investigate (a) differences in sexual problems between women with CPP and healthy controls and (b) moderators/mediators of sexual problems in women with CPP. It was hypothesized that compared to healthy controls, women with CPP would report more sexual problems and that the association of CPP with sexual problems would be moderated by sexual abuse and mediated by depression and anxiety.

Methods

Participants

Between 2001 and 2008, all consecutive women who visited a CPP-team of the gynaecological out-patient clinic of a university hospital were included in the study. If after gynaecological examination, ultrasound investigation and/or laparoscopy, no diagnosis or somatic explanation for their pelvic pain is found or if the complaint persists despite adequate treatment of the initial diagnosis, women are typically referred to and examined by the CPP team. Before consultation by the team women are asked to complete baseline questionnaires (see further). The control group was recruited by advertisement in local newspapers. Women were included if they did not suffer from pelvic pain, or reported a maximum of 3 days a month's pain related to the menses. Control women completed the questionnaires at the hospital and were compensated with €15 and travel expenses. Furthermore, to be included in the current study all women had to be over 18 years of age and had to have been in a hetero sexual relationship. Approval for this study was obtained from the Institutional Review Board of the hospital.

Measures

Primary outcome measure

Golombok Rust Inventory of Sexual Satisfaction (GRISS) [Van Lankveld 1999; Ter Kuile 1999]. The GRISS contains 28 items covering seven frequently occurring sexual complaints of heterosexual persons with a steady partner: anorgasmia, vaginismus/ dyspareunia, (in)frequency of sexual contact, sexual non-communication, dissatisfaction, nonsensuality, and avoidance of sex. In addition, it provides a total score of the person's dissatisfaction with sexual functioning within the relationship. A higher score indicates more sexual problems/dissatisfaction. The GRISS has been validated within the Dutch population and the psychometric properties are good [Van Lankveld 1999; Ter Kuile 1999]. The internal consistency of participants' data in our sample was found to be satisfactory ($.70 < \alpha < .82$ for the subscales and $\alpha = .93$ for the GRISS total-score)

Possible mediators and moderators

Current pain intensity was assessed using the Visual Analogue Scale (VAS) of the McGill Pain Questionnaire [Melzack 1975; Vanderiet 1987]. The Dutch version has good psychometric properties [Vanderiet 1987].

Physical impairment was measured using the Medical Outcome Study (MOS) 36-Item Short-Form Health Survey (SF-36) [Ware 1992; VanderZee 1996; Essink-Bot 1997; Aaronson 1998]. The psychometric properties of this questionnaire have been found to be adequate [Ware 1992; VanderZee 1996; Essink-Bot 1997; Aaronson 1998]. Aggregation of the 8 domains (physical functioning, social functioning, role limitations caused by physical health problems, role limitations caused by emotional problems, emotional well-being or mental health, vitality, bodily pain and general health perception) yields 2 measures: the Physical Component Summary (PCS) and the Mental Component

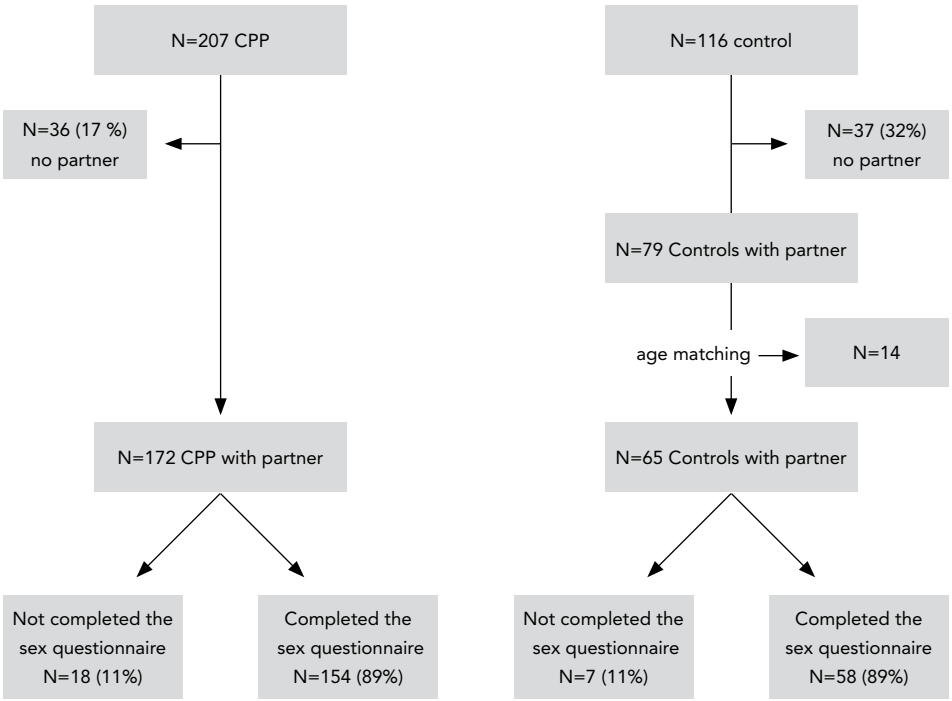
Summary (MCS) score, assessing physical and mental health respectively [Ware 1992]. In a norm-based scoring each scale has the same average (50) and the same standard deviation (10). Anytime a scale score is below 50, health status is below average.
The correlations between the MCS-score and both HADS subscales (r = -.70) and the HADS total score (r = -.75), were negative and statistically significant with a large effect size. Therefore for this study only the PCS-score was used. The internal consistency of participants' data in our sample was found to be satisfactory (α = .88 for the items with a high loading on the PCS score).
The presence of anxiety and depressive states was assessed using the Hospital Anxiety and Depression Scale (HADS) [Zigmond 1983; Spinhoven 1997]. It consists of two 7-item scales: one for anxiety and one for depression (score range of 0-21). Higher scores represent higher levels of symptoms of anxiety or/and depression The questionnaire is validated for the Dutch language and has good psychometric properties [Spinhoven 1997]. The internal consistency of participants' data in our sample was found to be satisfactory (α = .83 for the anxiety subscale and α = .85 for the depression subscale).
To assess *the prevalence of sexual as well as physical abuse* during childhood and later years the 7-item Sexual and Physical Abuse Questionnaire (SPAQ) questionnaire was used [Kooiman 2002]. Sexual abuse is restricted to sexual abuse with actual physical contact and physical abuse is confined to intentional violence resulting in some kind of physical injury as for example bruises. The criterion validity was found to be satisfactory [Kooiman 2002].

Statistical analyses

Descriptive statistics were calculated for all variables. Prior to analysis, all dependent variables were examined to determine whether they were normally distributed. The following subscales were transformed to better approximate normal distributions: GRISS vaginismus/ dyspareunia, GRISS dissatisfaction, GRISS nonsensuality, and GRISS avoidance of sex, GRISS total-score and the SF-36 PCS. These transformations resulted in a quasi-normal distribution with adequate skewness ($< |1|$).
In order to investigate whether compared to normal controls, women with CPP differed on biographic, somatic and psychological CPP characteristics, and sexual functioning univariate statistics were conducted.
The univariate association of sexual functioning with somatic and psychological CPP characteristics was assessed with correlation coefficients. If appropriate, variables which were significantly correlated with sexual functioning were subsequently entered stepwise in a hierarchical multiple regression model, statistically controlling for biographic variables.
In the present study mediation occurs if (1) CPP significantly affects the mediator (somatic and psychological CPP characteristics), (2) CPP significantly affects sexual functioning in the absence of the mediator, (3) the mediator has a significant and unique effect on sexual functioning, and (4) the effect of CPP on sexual functioning shrinks upon the addition of the mediator into the model [Baron 1986]. To formally evaluate whether putative mediators (partly) mediated the relationship of CPP and sexual functioning, the standard error of the mediated effect was bootstrapped [Mackinnon 2002]. The macro for SPSS-14

developed by Preacher and Hayes [Preacher 2008] was used to generate estimates for the indirect effects in multiple mediator models.
To test whether patient characteristics (i.e., sexual abuse) were non-specific predictors or moderators, multiple regression analyses were computed for sexual functioning. In the present study moderation occurs if a patient characteristic does interact significantly with CPP and sexual functioning. Thus, if there is a significant 'CPP X patient characteristic' interaction effect, the patient characteristic is a moderator. If the interaction term is not statistically significant but the patient characteristic predicts sexual functioning, than this factor is a non-specific predictor [Kraemer 2002].

Figure 1 *Selection of women with Chronic Pelvic Pain (CPP) and controls*



Results

Two hundred and seven women with CPP completed all questionnaires. One hundred and seventy two women of the 207 (83%) reported that they had a heterosexual relationship. Hundred and fifty four women of the 172 (89%) potential women with CPP completed the sex related questions. Seventy nine out of the 116 (84%) women in the control group reported to have a heterosexual relationship. To match the women in the control group with the women with CPP on age, 14 (18%) women were excluded in the control group, resulting in a mean age of 38.3 years old (SD = 10.3) in the CPP group and 39.2 years (SD = 10.0) in the control group. Especially, a larger proportion of women in the control group were found to be in the older age group (between 55 and 70) compared with women in the corresponding CPP group. No differences were observed between the percentage of women with CPP (N = 18; 11%) and controls (N = 7; 11%) who did not complete the sex related questions (see Figure 1).

Table 1 *Demographic and clinical variables of 154 women with Chronic Pelvic Pain at their initial visit to a Chronic Pelvic Pain (CPP) team and 58 controls*

	CPP N (%)	Controls N (%)	χ^2	*p*
Living with partner (yes)	134 (87)	46 (79)	1.95	0.16
Children (yes)	102 (66)	41 (71)	0.38	0.54
Level of education low[a] (yes)	45 (29)	5 (9)	9.92	0.01
Paid employment (yes)	91 (60)	38 (66)	0.49	0.48
Disability insurance benefit (yes)	46 (31)	1 (2)	20.03	0.01
Sexual abuse history (yes)	53 (35)	20 (35)	0.01	0.93
Physical abuse history (yes)	38 (26)	13 (22)	0.29	0.59
Characteristics of the CPP group				
Duration complaint (years) M (SD)	6.2 (6.2)			
Diagnoses N (%)				
Endometriosis (yes)	12 (8)			
Adhesions (yes)	34 (22)			
Endometriosis + Adhesions (yes)	10 (7)			
Ovarian cysts (yes)	8 (5)			
Other diagnosis (yes)	10 (7)			
None (yes)	80 (52)			
Operations for the CPP (yes)	132 (85)			
Total number of operations for CPP M (SD)	2.4 (1.9)			

N = Number; M = Mean; SD = Standard Deviation.

[a] level of education: low: primary school, special education, lower secondary education (vocational and general); high: upper secondary vocational education, higher professional education, pre-university, university.

The CPP group consisted of a sample of chronic pain patients with a mean duration of the pain problem of more than six years (range: 0.5 - 35 years). A variety of diagnoses like endometriosis, adhesions, cysts, were thought to be associated with the pelvic pain complaint. In addition, for 52% of the women no somatic abnormality had been identified (Table 1). More than 85% of the women had had a surgery for the pain problem before attending the CPP-team.

Differences in biographic, somatic and psychological characteristics between women with CPP and controls

A significantly higher percentage of women with CPP had a lower level of education and achieved disability insurance benefits compared with the women in the control group (Table 1). Moreover, women with CPP reported significantly more pain, depression and anxiety symptoms and were physically more impaired than women in the control group (Table 2).

Differences in sexual functioning between women with CPP and controls

As can been seen in Table 2, in comparison with controls, women with CPP reported significantly more sexual avoidance behaviour, nonsensuality and complaints of vaginismus. The total GRISS score was significantly higher in women with CPP than controls indicating that women with CPP were more dissatisfied with their sexual relationship than healthy controls.

Table 2 *Pain and adjustment to pain and sexual functioning of 154 women with Chronic Pelvic Pain at their initial visit to a Chronic Pelvic Pain (CPP)-team and 58 controls*

	CPP Mean (SD)	Controls Mean (SD)	*t*-value	*p*	*d*
CPP characteristics					
Pain severity	50.10 (24.02)	2.13 (5.35)	22.70	0.01	2.33
Physical impairment	37.20 (8.51)	54.54 (7.50)	- 11.16	0.01	2.11
Anxiety	6.73 (3.91)	3.77 (3.01)	5.83	0.01	0.81
Depression	6.05 (4.24)	2.26 (2.24)	8.32	0.01	1.00
Sexual functioning					
Infrequency	6.25 (2.33)	5.84 (1.88)	1.31	0.23	0.19
Non-communication	4.94 (1.89)	5.05 (1.59)	0.39	0.69	0.06
Dissatisfaction	7.95 (3.50)	7.64 (3.19)	0.44	0.66	0.09
Avoidance	7.28 (3.62)	5.78 (2.28)	2.86	0.01	0.46
Nonsensuality	6.88 (3.29)	5.83 (2.23)	2.31	0.02	0.35
Vaginismus	7.21 (3.55)	5.44 (2.54)	4.27	0.01	0.54
Anorgasmia	9.80 (4.17)	8.93 (2.97)	1.68	0.10	0.23
Sexual dissatisfaction	60.51 (19.10)	53.38 (12.98)	2.66	0.01	0.41

.2 < *d* <.5 = small; .5 < *d* < .8 = medium and *d* >.8 = large effect size [Cohen 1988]

Univariate predictors of sexual functioning

In the combined group of women with CPP and control women (N=212), the association between GRISS scores for sexual functioning (sexual avoidance, nonsensuality, vaginismus and sexual dissatisfaction) with the putative moderators (demographic and group characteristics) was assessed with point-biserial or Pearson correlation coefficients if appropriate. Of the biographic variables (i.e., age, living with a partner, parity, level of education, employment status and abuse) a history of sexual abuse was significantly correlated with the four GRISS-scales scores for sexual functioning, with women with a history of sexual abuse reporting more sexual problems. Furthermore the subscale for vaginistic complaints was significantly related with age and having children, indicating that nulliparous women and those who were younger in age reported more vaginistic complaints.
Of the putative mediating variables, pain severity, anxiety and depression were significantly and positively correlated with all the four GRISS scales for sexual functioning. Women with higher levels of pain, depression and anxiety reported more sexual problems. Furthermore, physical impairment was significantly and negatively correlated with vaginistic complaints indicating that more physically impaired women reported more vaginistic complaints (Table 3).

Table 3 *Correlation of sexual functioning with putative moderators and mediators in the total group of 212 women*

	GRISS Vaginismus	GRISS Avoidance	GRISS Nonsensuality	GRISS- total score Sexual dissatisfaction
Possible Moderators				
Age	-.16*	.02	.08	.07
Living with partner	.07	.09	.07	.03
Children	-.17*	.04	.07	.00
Level of education	.10	.02	.01	.01
Paid employment	.04	.07	.08	.01
Disability insurance benefit	.09	.03	.07	.08
Sexual abuse history	.22**	.22**	.24**	.22**
Physical abuse history	.02	.00	.02	.04
Possible Mediators: CPP characteristics				
Pain severity	.20**	.18*	.17*	.18*
Physical impairment	.18**	.10	.11	.13
Anxiety	.34**	.42**	.42**	.48**
Depression	.32**	.43**	.42**	.46**
CPP characteristics for the CPP group only (N=154)				
Duration of the complaint	.15	.05	.01	.08
Diagnosis	.02	.12	.02	.03
Operations for the CPP	.02	.10	.02	.07

*p <.05 and **p = <.01 GRISS=Golombok Rust Inventory of Sexual Satisfaction; CPP=Chronic Pelvic Pain.

Multivariate predictors of sexual functioning

On the basis of the results of these univariate analyses, those variables which were significantly correlated with sexual functioning were entered stepwise in separate hierarchical multiple linear regression models. The putative moderators/non-specific predictor (i.e., age and sexual abuse) were entered into the equation in the first step, and the putative mediators (i.e., pain, anxiety and depression) in the second step (p-value in = .05/p-value out = .1). The GRISS subscales for vaginismus, sexual avoidance and sexual nonsensuality and the GRISS total score for sexual dissatisfaction were used as dependent variables (Table 4). Because, it could be possible that the association between the dependent variables (sexual functioning) and putative mediators differs between women with CPP and controls, variables representing the interaction of CPP with the putative mediators were entered in the third step if appropriate (p-value in = .05).

For the dependent variable vaginismus, besides age and sexual abuse, anxiety and pain were entered in the equation, and explained an additional proportion of 12.0% of the variance in vaginistic complaints. Because of the high association of anxiety with depression ($r = .72$, $p < .01$), depression did not make an additional and independent contribution in vaginismus over and above anxiety. Together, age, sexual abuse, anxiety and pain did explain 17.5 % of the variance in vaginismus. None of the interaction terms were entered in the analysis (Table 4).

For the dependent variable sexual dissatisfaction (GRISS total score), besides sexual abuse, both anxiety and depression were entered in the equation, explaining an additional proportion of 21.5 % of the variance in sexual dissatisfaction. Together sexual abuse, anxiety and depression explained 26.3% of the variance in sexual dissatisfaction. Pain and none of the interaction terms were entered in the analysis (p-value in > .05). As can be seen in table 4, the multiple regression analyses with the GRISS subscales for sexual avoidance or nonsensuality as dependent measures showed a very comparable pattern as the total GRISS score. As none of the interaction terms between CPP X putative mediators were entered in one of the regression analyses, we can conclude that the relationship between the putative mediators and sexual functioning in women with CPP and controls does follow a comparable pattern.

Mediators of the association of CPP with sexual functioning

In order to test whether anxiety mediates the association of CPP with vaginismus, vaginismus was regressed upon anxiety and CPP (as pain was one of the main characteristics that was used in this study to differentiate between women with CPP and healthy controls, it was decided not to include pain severity as a putative mediator in the mediation analysis for vaginismus). In the mediation analysis age and a history of sexual abuse were entered as control variables. With these four variables (age, abuse, anxiety, and CPP) being included together in the regression equation, the relationship between vaginismus and CPP decreased in strength, from $\beta = .25$, $t = 3.87$, $p < .001$, to $\beta = .18$, $t = 2.60$, $p = .01$. Bootstrapping the indirect effects of anxiety on vaginismus using 5.000 bootstrap samples, anxiety proved to be a significant mediator of CPP in vaginismus, while controlling for age and sexual abuse.

In order to formally test whether anxiety and depression mediated the association of CPP with sexual dissatisfaction, sexual dissatisfaction was regressed on CPP and the two putative mediators, while controlling for sexual abuse in all equations. In the first step, sexual dissatisfaction was regressed upon presence of CPP, and showed that CPP significantly predicted sexual dissatisfaction, $\beta = .16$, $t = 2.39$, $p = .018$. In the second step, sexual dissatisfaction was regressed on CPP together with both putative mediators. With these four variables (abuse, CPP, anxiety and depression) being included together in the regression equation, the relationship between CPP and sexual dissatisfaction decreased in strength and was no longer significant, $\beta = .03$, $t = 0.48$, $p = .631$. Bootstrapping the indirect combined effect of anxiety and depression on the association of CPP with sexual dissatisfaction, both depression and anxiety proved to be significant and independent mediators of the relationship between CPP and sexual dissatisfaction, while controlling for sexual abuse. Similar results were found regarding sexual avoidance and nonsensuality as de-

Table 4 *Regression analyses predicting Vaginismus, Sexual Avoidance, Nonsensuality and Sexual dissatisfaction (N=212)*

Predictor	β	***t*-value**	***p* -value**
		Vaginismus	
(Constant)		9.45	0.01
Age	.14	2.04	0.04
Sexual Abuse	.13	1.90	0.06
Anxiety	.25	3.54	0.01
Pain	.17	2.43	0.02
		Sexual avoidance	
(Constant)		35.49	0.01
Sexual Abuse	.16	2.51	0.01
Anxiety	.25	2.67	0.01
Depression	.20	2.18	0.03
		Nonsensuality	
(Constant)		49.70	0.01
Sexual Abuse	.18	2.74	0.01
Anxiety	.25	2.70	0.01
Depression	.19	2.06	0.04
		Sexual Dissatisfaction (GRISS total score)	
(Constant)		114.35	0.01
Sexual Abuse	.16	2.58	0.01
Anxiety	.31	3.47	0.01
Depression	.20	2.19	0.03

Total model (Vaginismus) $R^2 = .175$, (F (4,182) = 9.66, $p < .01$); Total model (Sexual avoidance) $R^2 = .223$, (F (3,192) = 18.41, $p < .01$); Total model (Nonsensuality) $R^2 = .224$, (F (3,192) = 18.45, $p < .01$); Total model (Sexual Dissatisfaction) $R^2 = .263$ (F (3,201) = 29.96, $p < .01$).
GRISS = Golombok Rust Inventory of Sexual Satisfaction.

pendent variables. Both the CPP-sexual avoidance and CPP-nonsensuality relationships were totally mediated by anxiety and depression, while controlling for sexual abuse.These results suggest that the differences in sexual dissatisfaction, sexual avoidance and sexual nonsensuality between women with CPP and healthy controls were totally mediated by anxiety and depression. In addition, the difference found in vaginistic complaints between women with CPP and healthy controls was partly mediated by anxiety.

Moderators of the association of CPP with sexual functioning

Sexual abuse was the only patient characteristic that predicted sexual functioning, even after controlling for depression and anxiety (see Table 4). To assess whether sexual abuse was a moderator or a non-specific predictor of the association of sexual functioning with CPP, an interaction variable of sexual abuse X CPP was computed. In the first step of the multiple regression analyses CPP and abuse were entered. In the second step the interaction term of sexual abuse X CPP was entered if appropriate ($p < .05$). The four GRISS (sub)scales were used as dependent variables. The interaction between sexual abuse X CPP term did not account for a significant proportion in sexual functioning above the main effects of sexual abuse and CPP for each of the dependent variables for sexual functioning. These results indicate that the relationship between sexual abuse and sexual functioning in women with CPP and controls does follow a comparable pattern and that abuse is a non-specific predictor of sexual functioning in women.

Discussion

The study reported here examined (a) differences in sexual functioning between women with CPP and healthy controls and (b) moderators and mediators of sexual functioning in a clinical sample of women with CPP. As expected, women with CPP reported significantly more vaginistic complaints, sexual avoidance, nonsensuality and sexual dissatisfaction than age-matched controls. Moreover women with CPP reported significantly more pain, depression and anxiety and were physically more impaired than women in the control group. There were no group differences in reported history of sexual abuse. Finally the mediation analyses indicated that anxiety and depression were associated with sexual problems in all women but, given the fact that women with CPP have higher levels of anxiety and depression than controls, they also reported more sexual problems. Furthermore, sexual abuse was found to be a non-specific predictor of sexual functioning in all women.

In line with other studies we found that women with CPP reported more sexual complaints, such as vaginismus and dyspareunia [Collett 1998; Zondervan 2001; Grace 2004; Verit 2006; Florido 2008; Pitts 2008], but no differences were reported for orgasm problems or frequency of sexual contact [Grace 2004; Randolph 2006; Florido 2008; Pitts 2008]. Contrary to our hypothesis, we observed a striking resemblance in women with CPP and without CPP regarding the percentage of women that reported a history of sexu-

al abuse (35% in both samples). This percentage found in the current study is comparable with the percentages of 28% - 34% found in other samples of women with and without somatic or psychological complaints, using the same self-report measure [Kooiman 2002; Van Lankveld 2006; Weijenborg 2008; Brauer 2009]. These percentages are also comparable with the percentage of sexual abuse of 34% found in a large population study in the Netherlands, using a structured interview [Draijer 1990].

Of the putative mediating variables (i.e., pain, physical impairment, anxiety, and depression), pain, anxiety and depression were significantly and positively correlated with sexual functioning, with women with higher levels of pain, depression and anxiety reporting more sexual problems. In men with prostatitis/ CPP [Smith 2007; Aubin 2008] or other chronic non-cancer pain samples [Kraaimaat 1996; Tan 1998; Monga 1998; Kwan 2005], it is also found that sexual problems are associated with psychological factors as depression. After controlling for psychological variables (depression and anxiety), the direct association between pain and sexual functioning was no longer significant. These results indicate that the level of pain has an indirect effect on sexual functioning. Some studies [Kraaimaat 1996; Skevington 2001; Kwan 2005; Verit 2006] found a significant effect of pain intensity on sexual functioning while others did not observe such a relationship [Monga 1998; Randolph 2006]. Furthermore, in the group of women with CPP alone no association was found of duration of the pain problem, the amount of operations and specific somatic diagnosis with sexual complaints. So we can conclude that sexual functioning in women with CPP is more strongly associated with psychological pain characteristics (depression and anxiety) and to a lesser degree with somatic pain characteristics such as pain severity and physical impairment.

Our mediation analyses suggest that anxiety and depression are associated with sexual problems in all women but given that women with CPP have more anxiety and depression than do controls then this poses an extra burden on their sexual function. These results are comparable with the findings of Randolph and Reddy [Randolph 2006], who found in a non-clinical sample of women with CPP that depression mediated the effect of relationship factors on sexual behaviour and sexual relationship satisfaction. Furthermore, we found that in women with CPP as well as controls, sexual abuse was associated with worse sexual functioning, independent of somatic and psychological factors. So sexual abuse can be considered as a non-specific predictor for sexual functioning in women in general and not a specific predictor for women with CPP [Leonard 2002].

The findings of our study, however, have to be interpreted with caution, because the correlational nature of the findings regarding CPP, sexual functioning and anxiety/ depression precludes conclusions concerning the causality of relationships between these variables. Controlled (experimental or intervention) studies are required to elucidate the mediating role of anxiety and depression in the relationship of CPP with sexual functioning.

Some limitations of this study deserve mentioning. First, by using the GRISS to assess sexual problems, we can have underestimated the report of sexual problems. Although it is a well known and validated measure, it does not have specific questions regarding deep or superficial dyspareunia which is probably the most important complaint during sexual contact for women with CPP. The Vaginismus subscale does have items regarding discomfort with penetration, including pain, but does not differentiate between discomfort, pain and the location of the pain. Second, because the control group consisted of women who responded to an advertisement in a local newspaper we are not sure if this control group is a representative group of women of the Dutch population without pelvic pain. However, their response on the questionnaires for physical impairment, anxiety and depression were comparable with the norms of the control groups for the specific measures we used. Furthermore, it is not clear if the study findings can be generalized to other chronic pain problems in women, such as vulvodynia or to bladder pain syndrome/interstitial cystitis. Further studies are requested on women with other chronic pain problems.

The results of this study show that sexual abuse, anxiety and depression are associated with sexual problems in all women but given that women with CPP have more anxiety and depression than controls, this poses an extra burden on their sexual function which should be carefully assessed and treated.

Women in
PAIN

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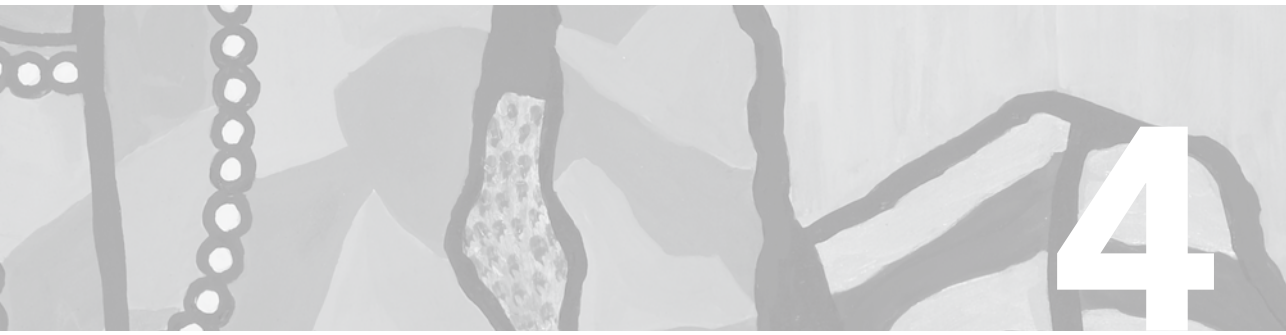
Acute abdominal pain in women at an emergency department: predictors of chronicity



4

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ABSTRACT

Background: Persistence of pain after acute abdominal pain has been encountered but predictors of chronicity are insufficiently known.

Aim: To assess the course of acute abdominal pain and to explore whether chronicity is predicted by baseline demographic and clinical variables.

Method: A follow-up study was conducted on all consecutive women who had visited an emergency department of a secondary care teaching hospital for acute abdominal pain. After a mean of 2.3 years 115 women (58%) completed questionnaires.

Results: At follow-up 34 women (30%) still suffered from abdominal pain complaints for more than 3 months the past year. Low education level ($\text{Exp}(\beta) = 4.21$, $p = .017$) and having experienced abuse before the age of 16 ($\text{Exp}(\beta) = 3.14$, $p = .016$) were significantly and independently associated with chronicity. No other socio-demographic or clinical factors predicted the outcome.

Conclusions: At a 2.3 year follow-up period nearly one third of all women with acute abdominal pain still suffered from pain. Low education level and abuse at younger age showed to be risk factors for pain persistence.

Introduction

Acute abdominal pain is a common reason for adults and children to visit an emergency department (ED) and is estimated to comprise 5-10% of all ED visits [ACEP 1994]. Three disease categories account for roughly three quarters of all patients with acute abdominal pain, being non specific abdominal pain (NSAP), appendicitis and cholecystitis [de Dombal 1979; de Dombal 1988]. Numerous diagnostics are used to establish a diagnosis and a variety of treatment strategies are offered ranging from expectative management with or without medication to clinical observation or surgery.

The course of pain in patients after an acute episode of abdominal pain is reported in some studies. Persistence of pain following diagnosis and treatment was observed in 16% of patients with acute NSAP [Jess 1982], in 20% of women with acute NSAP in the right hypogastric area [Morino 2006] and in 36% of women suffering form pelvic inflammatory disease (PID) [Haggerty 2005]. Only the last study found that bio-medical and psychosocial factors like prior PID episodes, non black race, being married, smoking and impaired mental health, were associated with this outcome. A development of chronic pain following an acute episode is also known after an acute trauma to the cervical or thoracic spine [Hestbaek 2003]. Physical and psychological risk factors for pain persistence have been cited in different reviews. For instance, the development of late whiplash syndrome usually due to a motor vehicle collision, was related to high initial neck pain and neck pain related disability [Williams 2007; Kamper 2008] as well as with lower self-efficacy and post-traumatic stress [Williamson 2008]. In patients with low back pain a perpetuation of pain was associated with baseline duration of pain and unemployment [Jacob 2004], depressive mood, somatization and catastrophizing [Pincus 2002]. Pain-related fear and subsequent avoidance behavior also appeared to be an essential feature for the development of a chronic problem for patients with musculoskeletal pain [Vlaeyen 2000].

Similarly, it could be hypothesized that after an acute episode of abdominal pain a number of patients continue to suffer pain and that predictors of chronicity can be identified. Increased knowledge about these factors may lead to early identification of patients at risk for the development of chronic pain and, through early and appropriate intervention, reduce this risk [White 1997].

Therefore, the aims of the present follow-up study are (1) to assess the course of acute abdominal pain in a cohort of adult women 2.3 years after their first visit to an emergency department and (2) to explore whether perpetuation of pain is associated with baseline demographic and clinical variables.

Methods

Patients

All consecutive women with acute abdominal pain who were enrolled in a diagnostic assessment study (DIBAB: 'Diagnostiek bij acute buik' (Diagnostics for Acute Abdominal Pain)) at the emergency department of the Red Cross location of the Dutch HAGA Hospital in The Hague [Toorenvliet 2009] in the period from June 2005 to July 2006, were invited to participate in the present follow-up study starting March 2008. Acute abdominal pain was defined as pain in the abdomen of less than 1 week's duration [de Dombal 1979]. During the DIBAB study women were initially assessed by a surgical resident at the ED of the middle-sized teaching hospital with a catchment population of 200,000. Patients who were evaluated at another hospital for the same pain complaint and/or had an additional radiological examination prior to surgical consultation and patients with abdominal pain due to trauma, were excluded in the DIBAB study.
For our present follow-up study eligible women had to be between 18-80 years old. If women were pregnant, had a diagnosis of a malignant disease at follow-up or were not able to understand, speak and write the Dutch language properly, they were excluded from participation.

Procedure

First a letter with information about the purposes of the study was sent inviting women to complete a follow-up assessment. Those who were not interested, were asked to return a form for refusal within two weeks. After this period, the other women were contacted by telephone by the research assistant (KG), who informed them again about the goal and practical consequences of the study and asked for participation. If patients consented, a set of questionnaires was sent to their home addresses. Participants were compensated with a gift coupon of €5 after completing the assessment and returning their signed informed consent form. Reminders to return the questionnaires were sent once.
Approval for this questionnaire based follow-up study of a cohort of women with acute abdominal pain was obtained from the 'Medical Ethical Review Board of South-West Netherland' (METC-nr 07-151).

Measurements

With exception of age and ED diagnosis, all variables were assessed at follow-up (see further).

Primary outcome measure

To evaluate the course of the acute pain, the existence of pain complaints over the past year was determined with the following question: "During the past year, did you have any abdominal pain?" Possible responses were coded on a nine-point Likert-scale: 1 = yes, during the whole year; 2 = yes, between 6 and 12 months; 3 = yes, about 6 months; 4 = yes, between 3 and 6 months; 5 = about 3 months; 6 = between 1 and 3 months; 7 = yes, between 2 weeks

and 1 month; 8 = yes, less then 2 weeks; 9 = no pain at all. Chronic abdominal pain was defined as pain for 3 or more months during the past year (score 1-5) [Merskey 1994].

Secondary outcome measures

Current pain intensity

Intensity of pain was assessed using a 100 mm Visual Analogue Scale (McGill VAS) of the McGill Pain Questionnaire Dutch Language Version (MPQ-DLV)[Vanderiet 1987; Van der Kloot 1989] with the endpoints "no pain" on the left and "worst pain" on the right side. Just like the original MPQ of Melzack [Melzack 1975] the Dutch version has good psychometric properties [Vanderiet 1987].

Adjustment to pain

(a) Health related quality of life was measured using the Rand-36 [Van der Zee 1994] - a Dutch version of the Medical Outcome Study (MOS) 36-Item Short-Form Health Survey (SF-36) [Ware 1992]. The psychometric properties of this questionnaire have been found to be adequate [Van der Zee 1996; Essink-Bot 1997; Aaronson 1998]. Aggregation of the 8 domains (i.e., physical functioning, social functioning, role limitations caused by physical health problems, role limitations caused by emotional problems, emotional well-being or mental health, vitality, bodily pain and general health perception) yields two measures: the Physical Component Summary (PCS) and the Mental Component Summary (MCS) score, assessing physical and mental health respectively [Ware 1994]. These component summaries are calculated according to the instructions of the user's guide (www.sf-36.org) using the normative data for women from a Dutch population [Aaronson 1998]. In this normbased scoring each scale has the same average (50) and the same standard deviation (10). Anytime a scale score is below 50, health status is below average.
(b) The presence of anxiety and depressive states was assessed using the Dutch version of the Hospital Anxiety and Depression Scale (HADS) [Zigmond 1983]. This questionnaire consists of two 7-item Likert-scales: one for anxiety and one for depression, both with a score range of 0-21. Higher scores represent higher levels of symptoms of anxiety or/and depression. The questionnaire is validated for the Dutch language and has good psychometric properties [Spinhoven 1997].

Predictors of outcome

Sociodemographic and clinical variables

A questionnaire was designed and covered (1) demographic characteristics such as education level, current employment status (also social security and disability insurance benefit) and cohabitation status with a partner, and (2) clinical variables comprising women's history of abdominal pain (yes or no) and abdominal surgery (yes or no) before the ED-visit as well as surgery for pain (yes or no) after this visit and during follow-up. These variables were combined with medical information retrieved from the findings of the DIBAB study and the electronic Hospital Information System (HIS). The diagnoses made at the ED as assessed in the DIBAB study, were recorded and categorized according to the

grouping as used by de Dombal [de Dombal 1988]. Acute 'non specific abdominal pain' (NSAP) comprised abdominal pain without a specific diagnosis and without the need for surgical intervention. Diagnoses accounting for abdominal pain in patients history before the ED visit or at follow-up, were not assessed.

Sexual and physical abuse

To assess the prevalence of sexual as well as physical abuse related to different age-periods (i.e., < 6 years old, between 6 and 12 years, between 12 and 16 years, 16 years and older), the Dutch 7-item Sexual and Physical Abuse Questionnaire (SPAQ) questionnaire was used. The criterion validity is found to be satisfactory [Kooiman 2002]. In this questionnaire sexual abuse is restricted to sexual abuse with actual physical contact and physical abuse is confined to intentional violence resulting in some kind of physical injury as for example bruises. The age period at what time the abusive experience first happened, is also addressed. The scores on the sexual and physical abuse measure are summarized independently and recoded, resulting in the "sexual abuse" or "physical abuse" (yes or no) score. By adding both scores the "abuse" score is obtained. Age at the time of the first sexual experience as well as having been forced to have sexual intercourse are associated with the level of severity of the abuse experience and subsequent consequences in life [Herman 1989].

Statistical analyses

The Statistical Package for Social Sciences (SPSS Inc., Chicago, Ill) version 14.0 for Windows was used for all analyses. The statistical significance (two sided) was set at $p < .05$. Descriptive statistics were calculated for all variables. Where necessary, datasets were transformed to get a normal distribution.

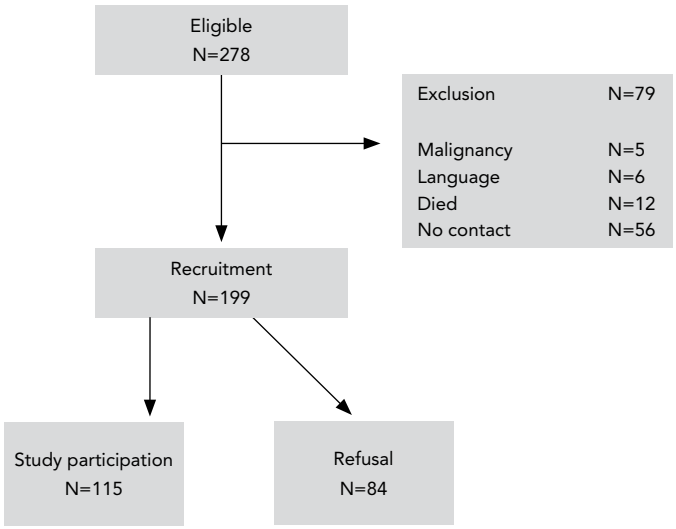
First, a description of the subjects of the study sample was given and a comparison of the results with those who did not consent participation was made by using Chi-squared (χ^2) and Student's *t*-test for independent samples in case of respectively dichotomous and continuous variables. Second, we used the same tests to determine an association between outcome (i.e., the report of suffering from abdominal pain for more than 3 months the past year) and pain severity at follow-up and adjustment to pain on the one hand and potential predictors like socio-demographic and clinical variables on the other hand. To indicate a measure of strength of the relationship between two variables in the context of the *t*-test means, we used Cohen's *d*, defined as the difference between two means divided by the pooled standard deviation for those means. This effect size of the observed effects is comparable with for instance Pearson's *r*, odds ratio (OR) etc. According to Cohen [Cohen 1988] .2 is indicative of a small effect, .5 of a medium effect and .8 and above of a large effect. Finally, baseline variables (or predictors) which were significantly associated with abdominal pain at follow-up, were subsequently entered in a stepwise logistic regression analysis. This procedure enabled us to assess the unique contribution of a baseline variable over and above the effect of a previously entered variable.

Results

Participants

Between June 2005 and July 2006, 802 consecutive patients (336 women, 42%) with acute abdominal pain were included in the DIBAB study, representing 2.8% of the annual emergency department (ED) patient load of 30,000 patients. After exclusion of women < 18 and ≥ 80 years of age, 278 women (85%) were eligible to participate in the follow-up study. A total of 79 women (28%) had to be withdrawn from further analyses because five of them (6%) had a malignant disease, six (7%) did not speak and/or read the Dutch language properly and 12 (15%) had died. Another 56 women (20% of the total sample) could not be contacted by telephone or mail to ask for participation. The mean of the ages of these excluded women did not differ significantly from that of the remaining 199 women. As illustrated in Fig.1, 115 women of this study sample (58%) were willing to participate. About half (51%) of the 84 women who refused participation, initially promised to take part in the study when they were telephoned, but did not return their assessment without any reason.

Figure 1 *Selection of study participants*



Patient characteristics

No significant differences were found in age between study participants (M = 43.7, SD = 15.6) and those who refused participation (M = 42.6, SD = 16.6) as well as in their medical history of abdominal pain. In comparison with those women who did not consent participation, study participants reported significantly more frequently abdominal surgery before as well as after their evaluation at the ED and they suffered less frequently from NSAP as final diagnosis. (See Table 1)

Table 1 *Pain, surgical history, diagnosis and treatment of 199 women visiting an emergency department with acute abdominal pain*

	Study sample N (=115)	Refusers N (=84)	χ^2	*p*	OR	95% CI
History						
Pain N (%)	40 (35)	20 (24)	2.775	0.960	1.707	0.907-3.211
Abdominal surgery N (%)	35 (30)	14 (17)	4.958	0.026	2.188	1.089-4.396
ED Diagnosis [a] N (%)						
Appendicitis	17 (15)	8 (10)	1.222	0.269	1.648	0.675-4.022
Cholecystitis	7 (6)	3 (4)	0.644	0.523[b]	1.750	0.439-6.976
NSAP	58 (50)	56 (67)	5.227	0.022	0.509	0.284-0.911
Acute gyn pathology	11 (10)	9 (11)	0.071	0.790	0.881	0.348-2.233
Pancreatitis	2 (2)	2 (2)	0.102	1.000[b]	0.726	0.100-5.258
Diverticular disease	14 (12)	5 (6)	2.176	0.140	2.190	0.757-6.339
Perforated peptic ulcer	2 (2)	-				
Small bowel obstruction	2 (2)	-				
Miscellaneous	2 (2)	1 (1)	0.098	1.000[b]	1.469	0.131-16.473
Treatment after ED visit						
Surgery (yes)	42 (37)	15 (19)	8.274	0.004	2.674	1.347-5.199

OR, Odds Ratio; ED, Emergency Department; NSAP, Non Specific Abdominal Pain (no surgery needed); gyn, gynaecological.

[a] diagnosis at emergency department categorized according to de Dombal [de Dombal, 1988];

[b] Fisher's Exact test (2-sided).

Prevalence of chronic pain

At follow-up after a period of 2.3 years (SD = 0.3), 34 out of 115 women (30%) said they still suffered from abdominal pain complaints for more than 3 months the past year and reported a mean pain intensity score of 23.7 (SD = 22.7). In this chronic pain group (CPG) a variety of diagnoses was observed (shown in Table 2.), but nearly 50% suffered from non specific abdominal pain. Fifty-three of all women (46%) reported no pain at all. In comparison with the 81 women who had recovered (Resolved Pain Group: RPG) the 34 CPG-women reported significantly higher levels of current pain intensity ($t(110)= 8.70, p < .01, d = 1.4$) and significantly lower adjustment to pain i.e., lower levels of physical health (Physical Component Summary score) ($t(106)= 4.40, p < .01, d = .9$) and higher mean scores for anxiety ($t(111)= 2.19, p = .03, d = .5$) and depressive symptoms ($t(111)= 2.94, p = .01, d = .5$).

Legend Table 2

CPG, chronic pain group (suffering from ≥ 3 months abdominal pain the last year); RPG, resolved pain group; ED, Emergency Department; SPAQ, Sexual and Physical Abuse Questionnaire; yr, year; NSAP, Non Specific Abdominal Pain.

[a] level of education low: primary school, special education, lower secondary education (vocational and general); high: upper secondary vocational education, higher professional education, pre-university, university.

[b] diagnoses at emergency department categorized according to de Dombal [de Dombal 1988]

[c] Fisher's Exact Test

Table 2 *Predictors of chronic abdominal pain at follow-up for 115 women suffering from acute abdominal pain who had visited an emergency department*

	CPG		RPG					
	N	N (%)	N	N (%)	χ^2	*p*	OR	95% CI
History								
Abdominal pain (yes)	34	13 (38)	81	27 (34)	0.254	0.614	1.238	0.539-2.844
Abdominal surgery (yes)	34	11(32)	81	24 (30)	0.084	0.772	1.136	0.480-2.691
SPAQ								
Abuse history (yes)	33	17 (52)	80	24 (30)	4.678	0.031	2.479	1.077-5.705
Abuse history <16 yr (yes)	33	14 (42)	80	16 (20)	6.024	0.014	2.947	1.221-7.115
Demographic								
Living with partner (yes)	34	20 (59)	81	53 (65)	0.451	0.502	1.325	0.582-3.015
Parity (yes)	34	23 (68)	81	53 (65)	0.052	0.819	0.905	0.386-2.122
Level of education low[a] (yes)	33	29 (88)	81	52 (64)	6.393	0.011	4.043	1.293-12.640
Paid employment (yes)	34	18 (53)	81	56 (69)	2.738	0.098	0.502	0.221-1.143
Disability insurance benefit (yes)	34	3 (9)	80	8 (10)	0.338	0.846	0.871	0.216-3.504
Treatment								
Surgery after ED visit (yes)	34	11 (32)	82	32 (40)	0.523	0.469	0.732	0.314-1.706
ED diagnoses [b]								
Appendicitis	34	3 (13)	81	14 (15)	1.361	0.243	0.463	0.124-1.730
Cholecystitis	34	4 (12)	81	3 (4)	2.722	0.193[c]	3.467	0.732-16.416
NSAP	34	17 (50)	81	41 (51)	0.004	0.952	0.976	0.438-2.174
Acute gynaecologic pathology	34	1 (3)	81	10 (12)	2.449	0.170[c]	0.215	0.026-1.751
Pancreatitis	34	1 (3)	81	1 (1)	0.408	0.348[c]	2.424	0.147-39.918
Diverticular disease	34	6 (18)	81	8 (10)	1.352	0.348[c]	1.055	0.622-6.142
Perforated peptic ulcer	34	1(3)	81	1 (1)	0.408	0.506[c]	2.424	0.147-39.918
Small bowel obstruction	34	-	81	2 (2)				
Miscellaneous	34	1 (3)	81	1 (1)	0.408	0.506[c]	2.424	0.147-39.918

Predictors of chronicity

Univariate analyses.

As illustrated in Table 2. low education level and an abuse history (combined sexual and physical abuse) were significantly associated with the report at follow-up of abdominal pain for more than 3 months the past year. Neither one of the other baseline socio-demographic variables, a history of pain and/or abdominal surgery at baseline nor the final ED diagnosis or having had a surgical intervention following the diagnosis, were associated with the outcome.

Multivariate analyses.

A logistic regression analysis was performed with the report of chronic pain at follow-up as dependent variable and the level of education and an abuse history as independent variables. The two variables did produce a significant regression model (Model: $\chi^2(2) = 12.36$, $p = .001$) and did account for 15% of the total variance in pain at follow-up which indicates a medium effect size according to Cohen [Cohen 1988]. Both variables, low education level (Exp(β) = 4.23, $p = .015$) and abuse history (Exp(β) = 2.81, $p = .021$), significantly contributed to the model.

Furthermore, we examined the report of abuse in two age-groups: women younger than 16 years of age and women of 16 years and older. A significantly larger percentage of women in the chronic pain group reported an abuse history before the age of 16 than in the recovered group (CPG = 42% versus RPG = 20%). The percentage of women that mentioned sexual and/or physical abuse during adulthood (≥ 16 years) did not differ between both groups (CPG = 18% versus RPG = 14%). We repeated the logistic regression analyses as described above and entered both age groups (abuse <16 years and abuse ≥ 16 years) stepwise into the equation. The variables produced a significant model ($\chi^2(3) = 13.46$, $p = .004$) explaining 16% of the total variance in pain at follow-up. Low education level (Exp(β) = 4.21, $p = .017$) and only abuse before the age of 16 years (Exp(β) = 3.14, $p = .016$) contributed significantly and independently to the model.

Discussion

After a mean follow-up period of 2.3 years in a cohort of 115 women who initially visited an ED for acute abdominal pain, we found that 34 women (30%) still suffered from abdominal pain for more than 3 months the past year. This chronic pain group reported higher levels of pain intensity and lower levels of adjustment to pain at follow-up in comparison with those women who said to have recovered. A lower educational level and an abuse history before the age of 16 emerged to be independent risk factors for the perpetuation of abdominal pain. Other baseline sociodemographic and clinical characteristics as well as the final ED diagnoses or having had a surgical intervention following the diagnosis were not associated with outcome.

Detailed comparison of our findings with the results of other studies is hampered by sample, design and measurement differences. Two studies were conducted in a patient population visiting an ED for acute abdominal pain. Sixteen percent of a sample of 198 patients (men and women) with an initial diagnosis of acute NSAP still suffered from abdominal pain at a 5 year follow-up [Jess 1982] and 20% of 88 women with acute NSAP in the right hypogastric area reported a continuation of pain at a 1 year follow-up [Morino 2006] after randomization to early laparoscopy or expectant management. The 30% of women still reporting abdominal pain at follow-up that we found in our study, was considerable higher than the percentages mentioned in these two previous studies [Jess 1982; Morino 2006]. However, our result was in line with the findings of the study of Haggerty and colleagues [Haggerty 2005] as they found that 36% of 780 women experienced chronic pain complaints in the pelvis over a mean follow-up period of 3 years after hospitalization and treatment for PID. In other pain conditions as acute neck and back pain the percentages of patients for whom pain complaints persist after an acute episode, have also a wide range varying from 3% to 70% dependent from the population studied, the design, the outcome and measurements used [Hestbaek 2003; Pengel 2003].

Not surprisingly, suffering from chronic abdominal pain at follow-up was associated with higher scores on pain severity, lower levels of physical health and higher levels of anxiety and depressive symptoms. These results indicated that CPG women showed to be more impaired in daily life compared to women who reported recovery from pain. Our findings concur with results of studies in other chronic pain populations [Keefe 2004].

Regarding predictors of chronicity we identified a low education level as an independent factor associated with the report of abdominal pain at follow-up. Similar findings emerged from studies on the course of back pain after an accidental trauma [Harris 2007] and the prevalence of chronic complaints of arm, neck and/or shoulder (CANS) in women [Huisstede 2008].
Furthermore, we observed that a report of sexual and/or physical abuse at a younger age was a prominent risk factor for perpetuation of abdominal pain. This result is in concordance with findings of a recent review that investigated the association of sexual and physical trauma with chronic pelvic pain (CPP) and irritable bowel syndrome (IBS) [Roelofs 2007]. There are indications that early traumata can affect the stress sensitivity of the HPA (Hypothalamic-pituitary-adrenal) - axis resulting in changes in cortisol levels. It is hypothesized that these changes are associated with higher vulnerability of a person to develop a chronic pain condition [Gatchel 2007].

A few methodological issues need to be discussed. First, by restricting our study sample only to female patients enrolled in the original DIBAB study we used a selection of all patients. If men were also included the so far unknown significance of the factor gender in the course of abdominal pain could have been estimated. Second, the study sample was a selection of all women visiting an ED during a one year period, because an unknown number of

women was primarily seen by a gynaecologist and not by a surgeon and was therefore not included in the original DIBAB sample. Third, the DIBAB study was primarily designed to prospectively assess clinical and radiological diagnoses and decision making in patients with acute abdominal pain at an ED. At a later stage, after data collection, the idea for the present follow-up study was raised. The design of our present study and subsequently the results could have been improved if for instance assessment of pain intensity, distress and pain appraisal and pain coping strategies had been added to the measurements at the time of the ED visit. From a study in acute back pain patients [Swinkels-Meeuwisse 2006] it has become apparent that psychological factors as catastrophizing and pain-related fear are even stronger predictors of perceived disability at follow-up than pain severity and socio-demographic variables. Also, by adding a question to the questionnaire whether the pain at follow-up was the same as it was initially during the ED visit, we could have been able to distinguish whether the pain at follow-up was a continuation or recurrence of the condition with which the women presented themselves or that it could also be a new or other pain condition in the abdominal region. Finally, the interpretation of our results could be limited by the potential of non-participation bias. Twenty percent of the original sample could not be contacted by telephone or mail. Moreover, the response rate in our present study was 58%, comparable with the response rates in our previous follow-up studies of 60% [Weijenborg 2007] and 64% [Weijenborg 2008]. However, Morino at a 1 year follow-up study cited a response rate of 75% whereas Haggerty even observed a response of 85%. The reason for this difference remains unclear although it is possible that treatment offered in the past had influenced the willingness to consent in a follow-up study. In our study we found some argument for this suggestion as study participation was significantly associated with having had a surgical intervention following the ED diagnosis.

Nonetheless, our results can have important clinical implications. Each health care provider has to be aware of the possibility that pain might continue in about 30% of the patients despite adequate diagnosis and treatment following acute abdominal pain. This transition from acute to chronic pain results in distress and disability. Low education level and having experienced abuse before the age of 16 were shown to be independent risk factors for chronicity. Further studies are needed to unravel biomedical, psychological and social factors that might play a role in the persistence of pain following an acute episode with the intention to identify those patients at risk for the development of chronic pain and to be able to elaborate interventions for prevention. In order to identify variables that may be implicated, individuals must be studied over time, beginning assessment prior to the onset of chronic pain [White 1997].

Women in
PAIN

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Clinical course of chronic pelvic pain in women

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ABSTRACT

Aim: A follow-up study on a cohort of women with chronic pelvic pain (CPP) was conducted, to evaluate the clinical course and to identify factors associated with outcome.
Method: Participants were over 18 years of age and had initially visited a multidisciplinary CPP-team of a Gynaecological Department of a University Hospital. The course of chronic pelvic pain was evaluated using the Life Chart Interview (LCI) method. All participants completed questionnaires covering demographic and clinical characteristics, pain (McGill) and psychological distress (SCL-90) at baseline and follow-up. The response rate was 60%. A survival analysis was conducted.
Results: After a mean follow-up period of 3.4 years, 18 women (25%) of the study sample (N = 72) reported recovery from pelvic pain (i.e., pelvic pain for less than 3 months per year). Eight of these 18 women (11% of the total sample) reported no pain at all at follow-up. Relapse of symptoms was not encountered. Not any demographic, clinical or pain related variable measured at baseline, nor any intervention between baseline and follow-up, was associated with outcome.
Conclusions: Our results indicate that chronic pelvic pain in women in secondary care is a longstanding condition. Further research is recommended to identify risk factors for persistence of symptoms.

Introduction

Chronic pelvic pain (CPP) in women is commonly described as continuous or intermittent pain in the lower abdomen, lasting for at least 6 months and not exclusively related to menstrual period or sexual intercourse [Williams 2004]. The condition cannot be explained medically. Even when some abnormality is present this may be coincidental rather than causal. Chronic pelvic pain can have a considerable impact in terms of interference with daily life activities and general well being which results in anxiety and depression [Savidge 1998; Grace 2006]. In a community based study in the US among women of reproductive age, a prevalence rate of 14.7% is found [Mathias 1996], and in the UK [Zondervan 2001] and New Zealand [Grace 2004] a rate of 24% and 25.4% is observed while both studies included also mid-cycle pain. In primary care, however, an annual prevalence rate of CPP in women of 3.7% is found, comparable with figures for asthma (3.8%) and back pain (4.1%) [Zondervan 1999a]. Of these women with CPP in primary care only 40% is referred to secondary or tertiary care [Zondervan 1999b]. Therefore gynaecologists, gastroenterologists, surgeons or other medical specialists will be confronted with a highly selected minority of the patient population. Moreover, CPP is a costly condition since it results in frequent use of health care resources and absence from work. About 10 years ago in the US the total annual direct costs for physician visits plus out-of-pocket expenses for CPP were estimated to be US$ 2.8 billion, but costs of diagnostic procedures or hospitalization were not included. In addition, the total indirect cost of CPP due to time lost from work was estimated at US$ 555 million [Mathias 1996]. Because the pathogenesis of CPP is poorly understood, often exhaustive diagnostic evaluations by different medical specialists are performed without revealing an obvious cause for the pain. Even more, the range of effective interventions remains limited and recommendations for treatment are based on single studies [Stones 2005].

Despite the high prevalence of CPP, the considerable impact on life, the related health care consumption and social costs, the poor diagnostic results and treatment options, little is published about the clinical course of chronic pelvic pain in women [Lamvu 2006]. Therefore, a follow-up study on women with CPP who had visited a chronic pelvic pain team was conducted at an interval of 1-6 years after initial assessment. The main aim was to obtain information about the clinical course of chronic pelvic pain by interviewing the former patients and exploring changes between baseline and follow-up assessment regarding reported pelvic pain severity and psychological distress. Second, we aimed to identify factors associated with outcome by concentrating on baseline demographic and clinical variables as previously recognized predictors of course and outcome of other chronic (pain) conditions [Janssen 1998; Cairns 2005; Croft 2006].

Methods

Setting

The gynaecological out-patient clinic of the Leiden University Medical Center provides local secondary and regional tertiary care for women with chronic pelvic pain. All women with CPP, who consult a gynaecologist of the out-patient clinic, are referred to the so-called chronic pelvic pain team (CPP-team). A visit to this team is offered to those women whose pelvic pain is medically unexplained (i.e., no somatic diagnosis found after gynaecological examination, ultrasound investigation or laparoscopy) as well as to all women who are still suffering from pelvic pain despite adequate treatment of their initial diagnoses. Members of the team are the referring gynaecologist, a dietician, physiotherapist and social worker or psychologist. All women are seen once by each team member for history taking and diagnostic examination, if appropriate. The goal of this integrated approach as introduced by Peters [Peters 1991] is to give equal attention to the somatic, psycho-social, dietary and physiotherapeutic aspects of a chronic pelvic pain problem. Before consultation of the team, women are asked to complete baseline questionnaires to summarize medical history and to assess pain and psychological distress. Based on all findings a particular treatment is recommended to each patient.

Participants

In 2003 all consecutive women were asked to participate in the current follow-up study if they had initially visited the CPP-team between April 1998 and November 2002, were still alive, over 18 years of age and able to speak and write the Dutch language. First a letter with information about the purposes of the study was sent to all women, inviting them to be interviewed about the course of their pelvic pain since their former visit to the CPP-team and to complete follow-up assessment. Those who were not interested could return a form for refusal within 2 weeks. After this period the other women were contacted by telephone by the first author (PW), who informed them again about the goal and practical consequences of the study and asked them to participate. If they consented, an appointment to visit the hospital for a personal interview and completion of questionnaires was scheduled. Travel expenses were compensated. Women were excluded if they were pregnant at the moment of the interview, if their memory was impaired or if they had had a malignancy during the follow-up period.

Measures

Clinical course of pain

At the time of the follow-up appointment, the course of the chronic pelvic pain was investigated using the Life Chart Interview (LCI) [Lyketsos 1994]. The LCI is a standardized instrument which is designed to obtain retrospectively information on the course of a particular complaint or psychopathology. The method draws from the literature on autobiographic memory and uses age- and calendar linked landmarks and life change anchors to prime recall. Accuracy of recall seemed to be quite good up to a

6 year period prior to recall, if occurrences of interest were linked to highly salient personal and affectively laden landmarks [Wagenaar 1986; Gladsjo 1992]. A time interval of 1 year turned out to generate data, which were in 75% agreement with a retest 1 week later [Lyketsos 1994]. The inter-rater reliability of a similar life chart instrument has shown to be satisfactory ($\kappa = 0.75$) [Hunt 1995]. The interview consists of two sections, the first one in which memory cues and temporal course of socio-demographic data are obtained and the second one in which the course of the psychopathology of interest is ascertained.
To investigate the clinical course of pelvic pain in women since their first visit to the CPP-team, the LCI was modified. Birthdays, deaths, holidays and life change anchors such as change in cohabitation status, residence and occupation were used as memory cues. To assess pelvic pain over a period of just 1 year the question was "During this particular year, did you have had pelvic pain?" with responses on a nine-point scale coded as 1 = yes, during the whole year; 2 = yes, between 6 and 12 months; 3 = yes, about 6 months; 4 = yes, between 3 and 6 months; 5 = about 3 months; 6 = between 1 and 3 months; 7 = yes, between 2 weeks and 1 month; 8 = yes, less than 2 weeks; 9 = no pain at all. Recovery was defined as pelvic pain less than 3 months during a 1 year period (score 6-9). Depending on patients' history, the interview took 1-3 h because for each year also information about pelvic pain related visits to and kind of diagnostics and treatments by gynaecologist(s) and/or other medical specialist(s), psychologist(s), physiotherapist(s) and alternative care provider(s) and use of pain medication was collected.

Predictors of outcome

At baseline just before the CPP-team visit and at follow-up before the interview, all participants were asked to complete self-administered written questionnaires covering assessment of pain, psychological distress and sections to address demographic, pain related and clinical variables. Potential factors associated with outcome were retrieved from these data.

Pain

The McGill Pain Questionnaire Dutch Language Version (MPQ-DLV) [Van der Kloot 1989] was used to assess self-reported pain. As the original MPQ of Melzack [Melzack 1975], the Dutch version has good psychometric properties [Vanderiet 1987; Verkes 1989]. From this questionnaire the "current pain intensity" was used and measured on a horizontal 100 mm visual analogue scale (Mc-Gill VAS) with the endpoints "no pain" on the left side and "worst pain" on the right side. Also "pain quality" was assessed with 20 categories of three or four adjectives describing diverse qualities of pain. The number of indicated words can be summed to obtain the total number of word counts (McGill NWC-T) with a maximum of 20. The rank values of the endorsed words have to be summed to obtain the total pain rating index (McGill PRI-T) with a maximum of 63. Higher values for NWC and PRI are indicating more pain. Because PRI-T is estimated to be the most valid index of change in self-reported pain [Melzack 1975], only this index was used in the final analysis.

Psychological distress

The total score of the Symptom Checklist-90 (SCL-90) [Derogatis 1977; Dutch adaptation Ettema 2003] was used to assess psychological distress (range 90-450).

Demographic, pain related and clinical variables

A questionnaire was designed to cover (1) demographic characteristics as age, education level, employment status (also social security and disability insurance benefit) and cohabitation status with a partner, (2) pain related issues such as the duration of pelvic pain complaint, the number of pain free days per month and medication use because of pain and (3) clinical variables addressing the number of gynaecological diagnostic procedures and surgical interventions, the number of consultations and treatments by other medical specialist(s), psychologist(s), physiotherapist(s) and alternative care provider(s) before the visit to the CPP-team. From medical records information was retrieved about the referral source (gynaecologist and other medical specialist or general practitioner), medical history and a sexual abuse history, systematically addressed and documented by the gynaecologist.

Ethical aspects

This follow-up study of a cohort of women with chronic pelvic pain was approved by the Institutional Review Board of the Leiden University Medical Center and all participants provided written informed consent.

Statistical analysis

Descriptive statistics were calculated for all variables. Differences in baseline and follow-up measurements were examined by using a Chi-squared (χ^2), McNemar test and Student's *t*-test. If appropriate, datasets were transformed to get a normal distribution or non-parametric statistics were used.

To investigate the clinical course of pelvic pain a survival analysis was conducted by using the number of months with pelvic pain at a time interval of 1 year, as obtained from the LCI. The cumulative probability of recovery was estimated with the Kaplan-Meier method. This technique describes all respondents over time, either to the event of interest (recovery from pain) or until they are lost to follow-up (censoring). Construct validity of the LCI was checked by evaluating whether outcome was related with changes in pain intensity, pain quality and changes in psychological distress. Therefore, standardized residual gain scores were calculated by removing from the follow-up and hence from the gain the portion that could have been predicted linearly from the baseline scores. This was done by regressing the follow-up scores on the baseline scores for all participants. The standardized residual is the residual divided by the sample standard deviation of the residuals. The standardized residuals have a mean of 0 and a standard deviation of 1. Differences in residual gain scores between being recovered or not were calculated with Student's *t*-test.

To identify factors associated with outcome survival curves for cohorts selected from relevant baseline demographic and clinical variables were plotted. With log-rank tests it was explored whether differences in survival curves were significant. By Cox' proportional hazards model (backward stepwise), the independent effect of these various variables was estimated.
The Statistical Package for Social Sciences (SPSS), version 11.0 for Windows, was used for all analyses. The statistical significance (two sided) was set at $p < .05$.

Results

Participants

One hundred and thirty-nine women were eligible to participate in the study. Based on the exclusion criteria, 6 women (4.3%) had to be withdrawn from further analyses, while 12 women (8.6%) were unable to be contacted. Baseline demographic and clinical variables of these 18 women did not differ significantly from the results of the remaining sample. Seventy-two women (60%) were willing to be interviewed, of whom three did not complete baseline assessment and two others did not fill out follow-up assessment. Baseline characteristics of the 72 participants and of those 49 women, who refused to be interviewed, are shown in Tables 1 and 2.

Table 1 *Demographic and clinical variables of 121 women with Chronic Pelvic Pain at their initial visit to a Chronic Pelvic Pain team*

	Study sample		Refusers			
	N	Mean (SD)	N	Mean (SD)	*p*	*d*
Age (years)	72	39.1 (9.7)	49	37.8 (9.8)	0.476	.13
	N	**N (%)**	**N**	**N (%)**	**OR**	**95%CI**
Living wit partner (yes)	69	57 (83)	46	34 (74)	0.596	0.241-1.476
Parity (yes)	68	49 (72)	46	26 (56)	0.504	0.229-1.108
Level of education low[a] (yes)	67	39 (58)	46	33 (72)	0.549	0.245-1.277
Paid employment (yes)	69	41 (59)	45	31 (69)	0.661	0.299-1.462
Disability insurance benefit (yes)	69	13 (19)	45	8 (18)	1.074	0.406-2.843
Sexual abuse history (yes)	70	20 (29)	46	15 (32)	1.207	0.530-2.746
Referral by specialist (yes)	72	62 (86)	46	40 (87)	1.075	0.362-3.190
Gynaecological surgery (yes)	69	63 (92)	46	34 (74)	0.315	0.113-0.874
Other medical specialist(s) (yes)	69	46 (67)	46	22 (49)	0.458	0.213-0.985
Psychological care (yes)	69	7 (10)	46	9 (19)	2.154	0.740-6.271
Physiotherapeutic care (yes)	69	23 (33)	46	10 (22)	0.556	0.235-1.314
Alternative care (yes)	69	18 (26)	46	10 (21)	0.787	0.325-1.903

[a] level of education low: primary school, special education, lower secondary education (vocational and general); high: upper secondary vocational education, higher professional education, pre-university, university. $d < .15$: negligible effect.

Table 2 *Pain characteristics, McGill and SCL-90 scores of 121 women with Chronic Pelvic Pain at their initial visit to a Chronic Pelvic Pain team*

	Study sample		Refusers			
	N	**Mean (SD)**	**N**	**Mean (SD)**	***p***	***d***
Duration of complaint (years)	72	5.7 (6.0)	49	7.7 (10.1)	0.783	.25
McGill VAS (mm) (0-100)	67	50.1 (25.9)	41	48.2 (25.2)	0.717	.07
McGill PRI -T (max: 63)	68	18.8 (8.8)	46	19.6 (9.4)	0.628	.09
SCL-90 (90-450)	68	135.9 (36.4)	46	149.9 (51.4)	0.164	.33
	N	**N (%)**	**N**	**N (%)**	**OR**	**95%CI**
Painfree days/months (yes)	69	21 (30)	46	15 (33)	1.106	0.496-2.466
Pain medication (yes)	69	50 (74)	46	37 (79)	1.562	0.635-3.842

McGill VAS, McGill Visual Analogue Scale; McGill PRI-T, McGill Pain Rating Index-Total score;
SCL-90, Symptom Checklist-90; SD, Standard Deviation; $d < .15$: negligible effect; $.15 \leq d < .40$: small effect.

All demographic and clinical variables of the final study sample did not differ significantly from the results of the refusers, except for two items. In the participants, sample a significantly larger percentage of the women than in the refusers' sample reported visits to other medical specialists and gynaecological surgical interventions before attending the chronic pelvic pain team. The variety of interventions, performed by gynaecologist, general surgeon or urologist as retrieved from patients' records, is illustrated in Table 3. One woman could have had more than 1 operation. However, it was not always clear whether all surgical interventions in a woman's history were performed because of the chronic pelvic pain complaint. Only 4 women (5.7%) in the study sample and 8 women (17.0%) in the refusers' sample did not have any surgical intervention before their initial CPP-team visit. No abnormality had been identified in 36 (50%) women of the study sample and in 25 (50%) women of the refusers' sample. In both samples in about 2/3 of the remaining cases adhesions were observed and in about 1/3 endometriosis was found. In only a minority of cases other diagnoses such as myoma uteri, ovarian cyst or IBS were reported.

Clinical course of chronic pelvic pain

Survival analysis showed that 18 women (25%) recovered during follow-up, as they reported pelvic pain for less than 3 months per year. Follow-up time varied between 1 and 6 years (M = 3.42, SD = 1.23). After recovery, relapse of symptoms was not encountered. Of those women who recovered, 50% recovered within the first 2 years and 75% within 3 years. Eight of these 18 women (11% of the total sample) reported full recovery (no pain at all) at the end of the follow-up period. For 54 women (75%) follow-up ended before recovery (censored cases). As all cases with a follow-up longer than 4 years were censored cases, cumulative survival at 6 years could not be calculated, but was 0.7, indicating that after 6 years follow-up 70% of all women had not reached recovery. During the interview

Table 3 *Number of surgical interventions in 121 women with Chronic Pelvic Pain prior to their initial visit to a Chronic Pelvic Pain team*

	Study sample N (%)	Refusers N (%)
None	4 (5.7)	8 (17)
Appendectomy	19 (27)	12 (26)
Laparoscopy diagnostic	59 (84)	32 (68)
Laparoscopy adhesiolysis	18 (26)	10 (21)
Laparoscopy (cystectomy.adnexectomy)	17 (24)	9 (19)
Hysterectomy	25 (36)	11 (23)
Laparotomy (+ adhesiolysis)	47 (67)	18 (38)
Hysteroscopy, D&C	25 (36)	17 (36)
Urethromtomy	6 (8)	3 (6)
Other	9 (12)	8 (17)
Total[a]	225 (321)	111 (236)

[a] For most women more than 1 surgical intervention was documented in their medical record.

no woman reported a malignancy or any newly diagnosed physical illness, related to the complaint of pelvic pain.

The validity of the outcome as reported during the interview was reflected in significantly lower residual gain scores for pain intensity (McGill VAS $t\,(64) = -4.596$, $p < .001$, $d = 1.35$), pain quality (McGill PRI-T $t\,(65) = -4.953$, $p < .001$, $d = 1.42$) as well as psychological distress (SCL-90 $t\,(61) = -2.319$, $p = .024$, $d = 0.69$) in women who had recovered. The indices for the effect size (d) indicated that the effect sizes of the differences found between women who had recovered and women who had not recovered, were estimated to be medium to large [Cohen 1988]. In addition, as illustrated in Table 4, the difference for pain intensity scores between baseline and follow-up assessment was found to be significant. A 2 x 2 repeated analysis of variance indicated that this difference was explained by being recovered ($F\,(1, 63) = 9.360$, $p < .01$).

Predictors of outcome

Self-reported pain intensity, pain quality, psychological distress, nor pain related variables like the duration of pain and medication use, nor any of the baseline demographic or clinical variables, nor a sexual abuse history, were related to recovery from pelvic pain. Furthermore, a multiple regression analysis indicated that pain intensity at follow-up was only significantly related with being recovered (yes or no) ($F\,(9, 51) = 2.553$, $p < .05$), even after adjustment for age, sexual abuse history, living together with a partner, being employed, duration of pain complaint, medication use, baseline pain intensity and psychological distress. In addition, with Chi-squared (χ^2) tests no association was found between recovery and clinical variables as reported by the participants for the period between baseline and follow-up (i.e., number of gynaecological diagnostic procedures

Table 4 *Pain characteristics, McGill and SCL-90 scores at baseline and follow-up for 69 women with Chronic Pelvic Pain*

	Baseline Mean (SD)	**Folluw-up Mean (SD)**	***p***	***d***
McGill VAS (mm)	49.4 (25.5)	37.5 (28.6)	0.014	.44
McGill PRI – T (0-63)	19.0 (8.9)	18.4 (12.9)	0.686	.05
SCL-90 (90-450)	138.2 (37.1)	141.7 (39.1)	0.399	.09
	N (%)	**N (%)**	**OR**	**95%CI**
Pain medication (yes)	50 (72)	42 (61)	7.000	2.083-23.522
Pain free days/month (yes)	21 (30)	35 (52)	3.500	1.077-11.371

McGill VAS, McGill Visual Analogue Scale; McGill PRI – T, McGill Pain Rating Index-Total score; SCL-90, Symptom Checklist-90; SD, Standard deviation; $d < .15$: negligible effect; $d \geq .40, < .75$: medium effect.

and surgical interventions, the number of consultations and treatments by other medical specialist(s), psychologist(s), physiotherapist(s) and alternative care provider(s)). Based on these analyses we did not observe any intervention that could have effected improvement in those who recovered.

Discussion

After a mean follow-up period of 3.4 years, we observed that 25% of a cohort of 72 women with chronic pelvic pain, who initially visited a multidisciplinary CPP-team, had recovered from chronic pelvic pain i.e., reported pelvic pain for less than 3 months per year in a standardized interview. Only 11% of these women experienced no pain at all at follow-up. No relapse of pelvic pain was encountered. Furthermore, recovery from chronic pelvic pain was not associated with any demographic, clinical, or pain related variable measured at baseline.

So far, only one other study [Lamvu 2006] has evaluated prospectively the clinical course of chronic pelvic pain in women at a 1 year follow-up period. In this study the outcome regarding self-reported pain was assessed for 370 women with CPP, who initially visited a CPP specialty clinic. The most common diagnoses included irritable bowel syndrome, adhesions, pelvic floor musculoskeletal disorders and endometriosis. At baseline and follow-up women had to complete self-administered written questionnaires. Improvement was observed in 46% of the women i.e., for 45 women (12%) the self-reported pain improved, whereas for 124 women (34%) their pain has been resolved. Improvement in self-reported pain was defined as a change in pain level from severe to moderate or mild or from moderate to mild depending from a change in categories of grouped sensory and affective components of McGill Pain Questionnaire pain scores. Comparing these results with our

findings, we observed a substantial lower percentage of recovery from pelvic pain. This discrepancy could well be explained by differences in definition of improvement, composition of the study sample, kind of pain measurement used and total time of follow-up. For instance, in our study improvement was defined as recovery from pelvic pain (i.e., less than 3 months pain per year), the LCI interview was used to assess not only the extent but also the speed of recovery. Furthermore, our study sample consisted of women with medically unexplained pelvic pain complaints.

Our findings could also be compared with recovery from pelvic pain in patients with CPP, allocated to a no treatment arm in randomized controlled trials (RCTs). Starting from the 14 RCTs for treating pelvic pain in women as included in a review of the Cochrane Collaboration [Stones 2005], the amount of recovery in the subjective report of pain, indicated by patients with CPP in the control condition, was observed to vary considerably ranging from 6% to 53% after a follow-up period from 2 weeks to 13 months. In our study with similar sample characteristics regarding age of participants, duration of pelvic pain and research setting, a comparable recovery rate of 25% was found whereas our follow-up period with a mean duration of 3.4 years was much longer.
Regarding factors associated with outcome, Lamvu and colleagues [Lamvu 2006] observed that improvement in pain was not related with any demographic nor clinical characteristic measured at baseline or kind of treatment women received. Our findings were in line with the results of this study. Recovery from pelvic pain was not associated with any of the baseline characteristics. Also in studies on the course of other chronic conditions as irritable bowel syndrome [Janssen 1998] and chronic fatigue syndrome [Cairns 2005], a similar result has been observed.

Our study has several strengths. First, we gathered information from a considerable number of women with chronic pelvic pain about the clinical course of their pelvic pain with a maximum follow-up period of 6 years. Second, the Life Chart Interview method was used as a standardized and reliable method by which information about the course of pelvic pain was gathered and the degree of recovery was examined in a time perspective. The construct validity of this method in our study was supported by the fact that patients who recovered, as indicated during the interview, had significantly lower residual gain scores for pain measures and psychological distress, than patients who had not recovered. Also pain intensity at follow-up could only be explained by being recovered, even after adjustment for various baseline characteristics. Finally, we used a clear definition of chronic pelvic pain and validated instruments to measure pain intensity, pain quality and psychological distress as recommended in chronic (pelvic) pain research [MacLean 2001; Williams 2004].

However, interpretation of our findings could be limited by the potential for non-participation bias. Our response rate was relatively high (60%) in comparison with 38% in the prospective 1 year follow-up study of Lamvu [Lamvu 2006]. Other follow-up studies after

laparoscopy among women with CPP showed response rates varying from 39% [Richter 1998] to 52% [Cox 2007]. As those women, who were not willing to participate in the follow-up study, did not differ significantly from the women of the study sample on most variables, we may conclude that our study results were not directly biased by response selection. In addition, still it is important to realize that the results of our study cannot be generalized to all women with chronic pelvic pain as this study was conducted in a secondary referral center, resulting in a study sample from a highly selected population.

From a clinical point of view our study has important implications. Knowledge about the clinical course of CPP will facilitate the interpretation of effectiveness of different interventions [Janssen 1998; Croft 2006]. Also, medical interventions should be guided by reliable information on clinical course and prognosis [Croft 2006]. Future studies are needed to replicate our findings and to identify risk factors for the persistence of chronic pelvic pain in women. These data could create an increased understanding of the condition and could give an impulse to generate new treatment modalities [Cairns 2005].
Moreover, based on findings in other chronic (pain) conditions [Turk 2004; Cairns 2005; Lamé 2005], new studies on the course of CPP in women have to be considered and focused on patient's beliefs and attributions about their illness. Consistently, a worse prognosis seems to be associated with patient's belief in a physical cause of their symptoms and having little perceived control over their symptoms.

In conclusion, our study results showed that chronic pelvic pain in women in secondary care is a longstanding condition, because a quarter of the study participants recovered and reported less than 3 months pain per year after a mean follow-up period of 3.4 years. Only 11% of these women experienced no pain at all at follow-up. No baseline variable was associated with recovery. Future research is urgently needed to get more insight in the clinical course of chronic pelvic pain in women and to identify predictors for chronicity.

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Women in
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Predictors of outcome in a cohort of women with chronic pelvic pain – A follow-up study

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ABSTRACT

Background: Chronic pelvic pain (CPP) in women is a long-lasting condition.
Aim: To explore changes in pain intensity, adjustment to pain, pain appraisal and coping strategies as well as to evaluate whether baseline pain appraisals and coping strategies and their changes were associated with outcome in the long term.
Method: A follow-up study was conducted on all consecutive women who had visited a CPP-team of a university hospital. After an average period of 3.2 years 64% of them (N = 84) completed questionnaires at baseline and follow-up.
Results: A reduction in pain intensity ($p < .001$, $d = .6$), improvement in adjustment to pain (SF-36 Physical Component Summary ($p < .001$, $d = .4$) and depressive symptoms ($p < .01$, $d = .2$)), as well as a reduction in catastrophizing pain ($p < .01$, $d = .4$) and an increase in perceived pain control ($p < .01$, $d = .3$) were observed. Neither biographic nor clinical variables were related with these changes. Pain appraisal and coping strategies at baseline did not predict changes from baseline in pain intensity. However, baseline levels of perceived pain control correlated with a change in depressive symptoms ($r = -.27$, $p < .05$), also after adjustment for pain intensity at baseline ($r = -.28$, $p < .05$). Changes from baseline in levels of catastrophizing pain were associated with changes in pain intensity ($r = .44$, $p < .01$), SF-36 Physical Component Summary ($r = -.34$, $p < .01$) and depressive symptoms ($r = .71$, $p < .01$).
Conclusions: At a 3 year follow-up, improvement in pain intensity in women with CPP was not associated with baseline pain appraisals and coping strategies. A reduction in catastrophizing was related to better outcome in the long term.

Introduction

Chronic pelvic pain (CPP) is a common condition in women [Mathias 1996; Grace 2004]. Of those who consult a general practitioner, only a minority is referred to secondary/tertiary care [Zondervan 1999; Grace 2004]. Gynaecologists and other medical specialists are hampered in adequate diagnostics and treatments because the aetiology of CPP is poorly understood, pathologies identified may be coincidental rather than causal and the range of effective interventions remains limited [Stones 2005]. Moreover, CPP can adversely affect daily life activities and general well-being [Grace 2006]. CPP is also a costly condition since it results in the frequent use of health care resources and absence from work [Mathias 1996; Grace 2006].

Recently, two uncontrolled follow-up studies [Lamvu 2006; Weijenborg 2007] investigated the clinical course of the condition in secondary/tertiary care CPP women. In both studies a chronicity of symptoms was confirmed. Risks for persistence like biographic variables, complaint characteristics or the kind of treatments given (medical or surgical), could not be identified. However, from studies in other chronic pain conditions, an increasing body of evidence emerges which suggests that pain appraisals and pain coping strategies can play a prominent role in the course of these complaints [Turk 2004]. For example, it has been noticed that the belief to possess the ability and resources to adapt to chronic pain, is positively related to an improvement in pain and adjustment to pain in the long term, while catastrophizing pain shows an inverse relationship. These findings have been used to develop new treatment modalities for a variety of chronic pain conditions as for instance chronic back pain, fibromyalgia and headache [Vlaeyen 2005]. If, similarly, an association between pain appraisals and pain coping on the one hand and pelvic pain severity on the other hand could explain differences in course of and adjustment to chronic pelvic pain, this would be of great value and provide further understanding about CPP in women.

Therefore, as a continuation of our previous study [Weijenborg 2007], we conducted a second follow-up study on a new cohort of CPP women. One to 6 years before at their first visit to a chronic pelvic pain team (CPP-team), all women had an initial assessment which was more extended than in the earlier study. The primary objectives were to investigate (1) the clinical course of pelvic pain by exploring changes in reported pain intensity, adjustment to pain (i.e., health related quality of life, anxiety and depression) and in pain appraisals and coping strategies between baseline and follow-up and (2) whether baseline levels of pain appraisals and pain coping and their changes from baseline were associated with pain and adjustment to pain in the long term.

Methods

Participants

All consecutive women who visited a CPP-team of the gynaecological out-patient clinic of the Leiden University Medical Center between July 2001 and January 2006, were invited to participate in the present study, conducted in the first 3 months of 2007. Eligible women were suffering from CPP at the time they were initially evaluated, had to be over 18 years of age and be able to understand, speak and write the Dutch language properly. If women were pregnant at the moment of the follow-up, they were excluded.

CPP is defined as a continuous or intermittent pain in the lower abdomen, lasting for at least six months and not exclusively relating to menstrual period or sexual intercourse [Williams 2004]. Typically, CPP women are examined by the CPP-team if, after gynaecological examination, ultrasound investigation and/or laparoscopy, no diagnosis or somatic explanation for their pelvic pain is found or if the complaint persists despite adequate treatment of the initial diagnosis. Members of the team are a gynaecologist, psychologist, dietician and physiotherapist. All women are seen once by each team member for history taking and examination, if appropriate. By this so-called integrated approach [Peters 1991] equal attention is given to the somatic, psycho-social, dietary and physiotherapeutic aspects of the chronic pelvic pain problem.

Before consultation by the team members women are asked to complete baseline questionnaires (see further). Based on all findings a particular treatment is recommended to each patient varying from pain management, physical therapy, dietary advice, medication, surgery, to a combination of these treatments or no intervention at all.

Procedure

For the present study first a letter with information about the purposes of the study was sent inviting women to complete a follow-up assessment. Those who were not interested were asked to return a form for refusal within two weeks. After this period, the other women were contacted by telephone by the first author (PW), who informed them again about the goal and practical consequences of the study and asked for participation. If women consented, a set of paper and pencil questionnaires was sent to their home addresses. Participants were compensated with a gift coupon of €15 after completing the assessment and returning their signed informed consent form. Reminders to return the questionnaires were sent twice.

Approval for this follow-up study of a cohort of women with chronic pelvic pain was obtained from the Institutional Review Board of the Leiden University Medical Center.

Measures

At baseline just before the initial CPP-team visit and at follow-up the same assessment was administered covering the following outcome measures.

Primary outcome measure

Current pain intensity was assessed using a 100 mm visual analogue scale (McGill VAS) of the McGill Pain Questionnaire Dutch Language Version (MPQ-DLV) [Vanderiet 1987; Van der Kloot 1989] with the endpoints "no pain" on the left side and "worst pain" on the right side. Just like the original MPQ of Melzack [Melzack 1975], the Dutch version has good psychometric properties [Vanderiet 1987].

Secondary outcome measures

Adjustment to pain

(a) Health related quality of life was measured using the Rand-36 [Van der Zee 1994]- a Dutch version of the Medical Outcome Study (MOS) 36-Item Short-Form Health Survey (SF-36) [Ware 1992]. The psychometric properties of this questionnaire have been found to be adequate [Van der Zee 1996; Essink-Bot 1997; Aaronson 1998]. Aggregation of the 8 domains (i.e., physical functioning, social functioning, role limitations caused by physical health problems, role limitations caused by emotional problems, emotional well-being or mental health, vitality, bodily pain and general health perception) yields 2 measures: the Physical Component Summary (PCS) and the Mental Component Summary (MCS) score, assessing physical and mental health respectively [Ware 1994]. These component summaries are calculated according to the instructions of the user's guide (www.sf-36.org) using the normative data for women from a Dutch population [Aaronson 1998]. In this normbased scoring each scale has the same average (50) and the same standard deviation (10). Anytime a scale score is below 50, health status is below average [Ware 2000].
(b) The presence of anxiety and depressive states was assessed using the Dutch version of the Hospital Anxiety and Depression Scale (HADS) [Zigmond 1983]. This questionnaire consists of two 7-item scales: one for anxiety and one for depression both with a score range of 0-21. Higher scores represent higher levels of symptoms of anxiety or/and depression. The questionnaire is validated for the Dutch language and has good psychometric properties [Spinhoven 1997].

Pain appraisals and pain coping strategies

To assess different pain appraisals and coping strategies related to pain, the Pain Coping and Cognition List (PCCL) [Stomp-van den Berg 2001], was used. The PCCL aims to measure cognitions related to pain in a comprehensive way and covers appraisals (i.e., attributions and expectancies) as well as cognitive coping strategies [Spinhoven 2004]. This 42-item questionnaire consists of 4 subscales: Pain Catastrophising (i.e., negative thoughts about the catastrophical consequences of pain), Pain Coping (i.e., primarily cognitive strategies for coping with pain such as diverting attention, ignoring pain or using coping self-statements), Internal Pain Control (i.e., positive expectations about personal control over pain) and External Pain Control (i.e., positive expectations about control over pain by medical specialists and significant others, for instance God). Higher scores on a particular subscale indicate a higher endorsement of the pain appraisal or coping strategy being measured. Psychometric properties of the PCCL are found to be adequate [De Gier 2004].

Predictors of outcome

In addition to the baseline levels and changes from baseline of the PCCL subscales, the following variables were assessed and used as potential predictors of pain and adjustment to pain at follow-up.

Sociodemographic, pain related and clinical variables

A questionnaire was designed and covered (1) demographic characteristics such as age, education level, current employment status (also social security and disability insurance benefit) and cohabitation status with a partner, (2) pain related variables as the duration of pelvic pain complaint and pain medication use and (3) clinical variables addressing the number of gynaecological consultations, diagnostic procedures, surgical interventions and final diagnosis, the number of consultations and treatments by other medical specialist(s), psychologist(s), physiotherapist(s) and alternative care provider(s) before the visit to the CPP-team and also between this visit and follow-up. These last variables were combined with information retrieved from patients' records. Also the referral source (medical specialist or general practitioner) was taken from these notes.

Sexual and physical abuse

To assess the prevalence of sexual as well as physical abuse during childhood and later years the 7-item Sexual and Physical Abuse Questionnaire (SPAQ) Dutch questionnaire was used. The criterion validity was found to be satisfactory [Kooiman 2002].

Statistical analysis

Descriptive statistics were calculated for all variables. Where necessary, datasets were transformed to get a normal distribution.

The first step included a description of the subjects of the study sample and a comparison of the results with those who did not consent participation, by using Chi-squared (χ^2) and Student's *t*-test for independent samples. To indicate a measure of strength of the relationship between two variables in the context of the *t*-test means, we used Cohen's *d*, defined as the difference between two means divided by the pooled standard deviation for those means. This effect size of the observed effects is comparable with others like Pearson's *r*, odds ratio (OR) etc. According to Cohen [Cohen 1988] .2 is indicative of a small effect, .5 a medium and .8 a large effect. In the second step changes between baseline and follow-up measurements of the primary and secondary outcome measures were evaluated by using Student's *t*-tests for dependent samples and Chi-squared (χ^2) tests, in case of respectively continuous or dichotomous variables. The third step investigated the association between a change in the primary and secondary outcome measures (current pain intensity and adjustment to pain) on the one hand and baseline variables i.e., demographic, pain related and clinical variables on the other hand. For the analyses Pearson product-moment correlation coefficients (*r*) and Student's *t*-test for independent samples were used. For changes in primary and secondary outcome measures standardized residual gain scores were calculated by removing from the follow-up and hence from the gain the portion

that could have been predicted linearly from the baseline scores. As a fourth step, associations between baseline levels of pain appraisals and coping strategies (PCCL subscales) on the one hand and changes in primary and secondary outcome variables at follow-up on the other hand were investigated by calculating Pearson product-moment correlation coefficients (*r*), and also after controlling for baseline levels of current pain intensity by calculating partial correlations. Finally, to assess associations between changes in baseline levels of pain appraisals and coping strategies (PCCL subscales) with changes in primary and secondary outcome variables at follow-up Pearson product-moment correlation coefficients (*r*) were used.
The Statistical Package for Social Sciences version 14.0 for Windows (SPSS Inc., Chicago, Ill) was used for all analyses. The statistical significance (two sided) was set at $p < .05$.

Results

Participants

One hundred and sixty three women were eligible to participate in the study. At follow-up 3 women (1.8%) had to be withdrawn from further analyses because two were pregnant and one woman had died. Another 29 women (17.8%) could not be contacted. Baseline demographic and clinical variables of these 32 women did not differ significantly from the results of the remaining sample (N = 131). Forty-seven women (36%) refused to participate in the study of whom 32 (68%) did not give a reason. It was remarkable that 15 of these 32 (50%) women promised to participate at the moment they were telephoned, but that they did not return their assessment despite 2 reminders. The others gave motives for nonparticipation like "being without pain, less pain, too much pain" (15%), "discontent with previous CPP management" (12%) or "having no time" (5%).
The demographic and clinical characteristics at baseline of the study participants and of those who refused, are shown in Table 1. Participants were significantly older ($p < .05$, d .4) and lived more frequently together with a partner (OR: 0.380, 95% CI: 0.172-0.836). Furthermore, participants reported significantly more depressive symptoms ($p < .05$, $d = .4$) at their initial visit to the CPP-team than those who did not consent to participate in the follow-up study (this data set is not shown).

As illustrated in Table 2, the women in the study and refusers' sample underwent a variety of surgical procedures performed by gynaecologists, general surgeons and urologists, before they consulted the CPP-team. No considerable differences were observed with respect to the percentages of women who had no surgical intervention (25%) at baseline and for whom no abnormality was identified after various diagnostic procedures (50%). Also, in both samples the diagnoses as indicated in patients' records, were similar. Adhesions were found in about 25% and endometriosis with or without adhesions in about 20% of the cases, although these diagnoses were not considered to explain the chronic pelvic pain complaints. In the remaining cases other diagnoses such as myoma uteri, ovarian cyst or IBS,

Table 1 *Demographic and clinical variables of 131 women with Chronic Pelvic Pain at their initial visit to a Chronic Pelvic Pain team*

	Study sample		Refusers			
	N	**Mean (SD)**	**N**	**Mean (SD)**	***p***	***d***
Age (years)	84	40.2 (11.3)	47	36.1 (11.4)	0.046	.4
	N	**N(%)**	**N**	**N(%)**	**OR**	**95%CI**
Living with partner (yes)	83	66 (80)	47	28 (60)	0.380	0.172-0.836
Parity (yes)	84	54 (64)	47	23 (49)	0.532	0.258-1.100
Level of education low[a] (yes)	84	65 (77)	47	34 (73)	1.308	0.577-2.965
Paid employment (yes)	84	45 (54)	46	20 (43)	1.500	0.727-3.093
Disability insurance benefit (yes)	84	28 (33)	45	14 (31)	1.107	0.509-2.409
Sexual abuse history (yes)	75	30 (40)	43	14 (33)	1.381	0.628-3.035
Physical abuse history (yes)	69	14 (20)	42	9 (21)	0.933	0.364-2.394
Referral by specialist (yes)	84	74 (88)	47	43 (92)	0.688	0.203-2.329
Gynaecological surgery (yes)	84	62 (74)	47	34 (72)	1.078	0.483-2.406
Other medical specialist(s) (yes)	84	48 (57)	47	22 (49)	1.515	0.739-3.105
Endo and/or adh[b] (yes)	84	33 (39)	47	17 (36)	1.142	0.545-2.390
Psychological care (yes)	84	12 (14)	47	8 (17)	0.813	0.306-2.156
Physiotherapeutic care (yes)	84	33 (39)	47	22 (47)	0.735	0.358-1.512
Alternative care (yes)	84	24 (29)	47	15 (30)	0.853	0.393-1.852

[a] level of education low: primary school, special education, lower secondary education (vocational and general); high: upper secondary vocational education, higher professional education, pre-university, university.
[b] endometriosis and/ or adhesions diagnosed; *d* =.2: small effect; *d* =.5: medium effect.

Table 2 *Number of surgical interventions in 131 women with Chronic Pelvic Pain prior to their initial visit to a Chronic Pelvic Pain team and in 84 women between the initial assessment and follow-up*

	Study sample (N=84) N (%)	**Refusers (N=47) N (%)**	**Follow-up (N=84) N (%)**
None	22 (26)	13 (28)	65 (77)
Appendectomy	30 (36)	10 (21)	1 (1)
Laparoscopy diagnostic	65 (77)	26 (55)	9 (11)
Laparoscopy adhesiolysis	7 (8)	3 (6)	0 (0)
Laparoscopy (cystectomy.adnexectomy)	21 (25)	10 (22)	4 (5)
Hysterectomy	18 (21)	14 (30)	6 (7)
Laparotomy (+ adhesiolysis)	42 (50)	10 (22)	3 (4)
Hysteroscopy, D&C	9 (11)	3 (6)	2 (2)
Urethrotomy	2 (2)	1 (2)	2 (2)
Other	18 (21)	3 (6)	3 (4)
Total	234 (278)[a]	93 (197)[a]	30 (36)

[a] For most women more than 1 surgical intervention was reported and documented.

were reported. For further analyses the diagnoses were reduced into 2 groups: those women with endometriosis and/or adhesions versus those women with other or no pathology.

Change in primary outcome measure

Table 3 shows that the mean scores for current pain intensity decreased significantly from baseline ($p < .001$, $d = .6$) after a mean follow-up period of 3.2 years (SD = 1.3, range 1-6). Forty percent of the participants reported a reduction in pain intensity of at least 50%, reflecting a substantial and clinically meaningful improvement [Johnson 2004; Dworkin 2008]. However, only 17 women (20.2%) said that they had recovered from pelvic pain as they reported to suffer pain for less than three months during the last year [Weijenborg 2007]. Seven of these 17 women (8.3% of the total sample) stated full recovery (no pain at all).

Change in secondary outcome measures

Between baseline and follow-up we observed a significant improvement in adjustment to pain, particularly for the SF-36 PCS score ($p < .001$, $d = .4$) and depressive symptoms ($p < .01$, $d = .2$). In addition, a significant reduction in the mean values of the PCCL subscale catastrophizing ($p < .01$, $d = .4$) and a significant improvement in the subscale internal pain control ($p < .01$, $d = .3$) were found.

Table 3 *Current pain intensity (McGill VAS), pain medication use, quality of life summary scales (SF-36), anxiety and depression scores (HADS) and pain appraisal and pain coping (PCCL) at baseline and follow up for 84 women with Chronic Pelvic Pain*

	Baseline N (%)	**Follow-up N (%)**	**OR**	**95% CI**
Pain medication (yes)	64 (77)	48 (59)	1.759	0.625-4.955
	Mean (SD)	**Mean (SD)**	***p***	***d***
McGill VAS (mm)(0-100)	50.4 (26.5)	34.8 (28.2)	0.000	.6
SF-36 summary scale				
Physical component (PCS)	36.4 (9.4)	40.2 (9.8)	0.000	.3
Mental component (MCS)	39.0 (9.5)	41.1 (10.4)	0.119	.3
HADS				
Anxiety	6.6 (4.0)	6.9 (4.4)	0.491	.1
Depression	6.4 (4.5)	5.5 (4.9)	0.008	.2
PCCL				
Catastrophizing	3.2 (1.0)	2.8(1.2)	0.002	.4
Coping	3.5 (1.0)	3.6 (1.0)	0.806	.0
Internal Pain control	3.0 (1.0)	3.4 (1.0)	0.001	.3
External Pain control	2.9 (1.0)	2.7 (1.0)	0.056	.2

McGill VAS, McGill Visual Analogue Scale; HADS, Hospital Anxiety and Depression Scale; PCCL, Pain Coping and Cognition List; SD, Standard Deviation; *d* =.2: small effect; *d* =.5: medium effect; *d* =.8: large effect.

Predictors of outcome

Correlation analyses revealed that none of the demographic variables at baseline such as age, living together with a partner, level of education, being employed or getting disability insurance fees, were associated with changes in current pain intensity and changes in adjustment to pain (i.e., SF-36 PCS score and depressive symptoms). In addition, no associations were found between outcome and baseline pain related variables like duration of pelvic pain and pain medication use. Clinical factors such as the number and kind of medical consultations, treatments or surgical interventions and a diagnosis of endometriosis and/or adhesions assessed at baseline and reported at follow-up were also not related to the outcome (see also Table 2).

Furthermore, as shown in Table 4, changes in current pain intensity were not related to one of the PCCL subscales measured at baseline.This finding indicated that baseline pain appraisals or coping strategies did not predict improvement in pain intensity at follow-up. However, baseline levels of the PCCL subscale internal pain control were significantly and negatively associated with changes in depressive symptoms (r = -.273, $p < .05$), also after adjustment for baseline pain intensity (r = -.275, $p < .05$). This result showed that independently of baseline pain intensity scores, women who at baseline perceived themselves as being more effective in pain control, reported at follow-up to feel less depressed. Moreover, significant associations were found between changes in the PCCL subscales catastrophizing and internal pain control on the one hand and changes in pain intensity and adjustment to pain on the other hand. These results implied that a decrease in the levels of catastrophizing and an improvement of perceived pain control were related to an improvement from baseline to follow-up in pain intensity, health related quality of life

Table 4 *Pearson Moment Correlation Coefficient between subscales of the Pain Coping and Cognition List (PCCL) assessed at baseline and their changes on the one hand and changes in outcome measures on the other hand, adjusted for baseline scores*

Baseline	Rgs VAS	Rgs PCS	Rgs HADS-D
Catastrophizing[a]	-.006 (-.063)	-.038 (-.008)	.020 (.042)
Coping [a]	.067 (.136)	-.088 (-.065)	-.044 (-.048)
Internal Pain Control [a]	-.001(-.006)	-0.19 (-0.72)	-.273* (-.278*)
External Pain Control[a]	-.030 (-.016)	.072 (.132)	.060 (.030)
Rgs Cata [b]	.477** (.444**)	-..439** (-.341**)	.758** (.708**)
Rgs Internal Pain [c]	-.354** (-.176)	.355** (.186)	-.300** (-.051)

Rgs: residual gain score; VAS: MPQ-VAS; PCS: Physical Component Summary; HADS-D: HADS subscale depression; Cata: Catastrophizing; Internal Pain: Internal Pain Control.

* significant at 0.05 level; ** significant at 0.01 level

[a] Between parentheses: Pearson Moment Correlation Coefficient (r) adjusted for baseline scores of the MPQ VAS.

[b] Between parentheses: Pearson Moment Correlation Coefficient (r) adjusted for changes in internal pain control

[c] Between parentheses: Pearson Moment Correlation Coefficient (r) adjusted for changes in catastrophizing.

especially physical health and depressive symptoms. Because the changes for catastrophizing pain and internal pain control were negatively and significantly correlated in this sample of CCP women (r = -.388, $p < .01$), the analyses were repeated while controlling for changes in internal pain control and catastrophizing respectively. Changes in catastrophizing were still significantly correlated with outcome, after controlling for changes in internal pain control, but changes in internal pain control were not associated with outcome, after controlling for changes in the levels of catastrophizing. Therefore, it could be inferred that the association between changes in internal pain control and changes in pain and adjustment to pain, was a mediated consequence of changes in catastrophizing.

Discussion

After a mean follow-up period of 3.2 years we found in a cohort of 84 women with chronic pelvic pain that from baseline current pain intensity decreased and adjustment to pain improved. Also compared to baseline, women were less inclined to catastrophize their pain and perceived themselves as being more effective in pain control at follow-up. We found that a reduction in pain intensity was not associated with any of the baseline pain appraisals and pain coping strategies. However, independently from baseline pain intensity, women with higher expectations to have personal control over pain at baseline felt less depressed at follow-up. Also, a decrease in catastrophizing thoughts about the consequences of pain was related to an improvement in pain and adjustment to pain as reported between baseline and follow-up.

Our current findings illustrate the potential role of pain catastrophizing and internal pain control in the prediction of pain intensity and adjustment to pain in the long term in women with chronic pelvic pain. So far, other studies on chronic pelvic and abdominal pain studying a possible association between these factors and outcome are scarce. In line with our results Norman [Norman 2004] observed that baseline catastrophizing was not independently related to outcome in a randomised controlled trial investigating the effect of disclosure (i.e. writing therapy) on pain and disability in CPP women. Also Drossman [Drossman 2000] found that baseline levels of perceived pain control predicted a better health outcome at a 1 year follow-up in female patients suffering gastro-intestinal pain disorders. Furthermore, our findings that changes in catastrophizing between baseline and follow-up were associated with changes in pain and adjustment to pain, have also been reported in treatment outcome studies of other chronic pain conditions as chronic back pain [Spinhoven 2004], general chronic pain [Jensen 2001], fibromyalgia [Nielson 2004]. However, these results were not observed in a randomized clinical trial in patients with irritable bowel symptoms (IBS) [Lackner 2007].

Considering the course of pain in CPP women, the results of our present study concur with findings of our previous report about the clinical course of chronic pelvic pain in

72 CPP women [Weijenborg 2007]. In both studies, we observed a significant decrease in current pain intensity from baseline with a medium effect size (respectively $d = .6$ and $d = .4$) at an average of 3 year follow-up. Not any of the demographic, pain related or clinical variables such as the number and kind of medical consultations, treatments or surgical interventions assessed at baseline or reported at follow-up, were associated with outcome. These results are also consistent with the findings of Lamvu [Lamvu 2006] who observed at a 1 year follow-up that the mean score for pain intensity of a cohort of 370 CPP women in a pain specialty clinic decreased significantly irrespective of the treatments given.

Moreover, in our present study we evaluated changes from baseline in adjustment to pain and found significant improvement in health related quality of life especially physical health and depressive symptoms. Our findings could be compared with the results of other CPP studies that measured these variables, although a thorough comparison is hampered by design, sample and measurement differences between studies. Substantial improvement in health related quality of life (i.e., SF-36 domains bodily pain, vitality, physical and social functioning and role limitations physical) was reported at a 1 year follow-up of 100 patients suffering abdominal pain and adhesions after a diagnostic laparoscopy with or without adhesiolysis [Swank 2003]. Treatment of CPP with sertraline resulted in a significant improvement of the general health perception domain of the SF-36 and a significant decrease in the SF-36 role limitations emotional domain at the end of a 3 months study while no changes in the SF-36 domains were found in those women allocated to the placebo condition [Engel 1998]. Regarding depressive symptoms no changes in depression scores were noticed at a 1 year follow-up study of CPP patients [Lamvu 2006] and at the end of a 3 months' treatment outcome study in CPP women allocated to sertraline or placebo [Engel 2003]. However, an improvement in depression scores was encountered 4-9 months after ultrasound counseling as well as in the "wait and see" condition following a negative laparoscopy [Ghaly 1994] and also at a 12 months follow-up after the end of treatment with gosereline or medoxyprogesterone acetate [Soysal 2001]. So, an improvement in health related quality of life and depressive symptoms was examined not only in our study, but also in some of these treatment outcome and follow-up studies in CPP women.

However, our findings have to be interpreted with caution. First, we do not know which specific factor(s) caused the improvement from baseline found in reported pain intensity, adjustment to pain and pain appraisals. As indicated by Whitney [Whitney 1992], when a patient seeks treatment for a pain condition, subsequent improvement may be due to (1) specific effects of treatment (i.e., medication or a surgical procedure), (2) non-specific effects of treatment as for instance the provider's attitude towards the patient, the faith of the patient in treatment etc. and (3) "regression to the mean" indicating the phenomenon that a variable that is extreme on its first measurement will tend to be closer to the centre of the distribution on later measurement [Davis 1976; Whitney 1992]. It is unlikely that changes in pain intensity and secondary outcome measures as observed in our study, can be explained by the effects of specific interventions because we did not find an as-

sociation between outcome and the number or kind of treatments or surgical procedures reported at the first assessment or between that time and follow-up. Also, because we did not study patient-provider interactions or patient expectations as contributors to the effect of treatment, we cannot assign these non-specific factors as an explanation for our findings. However, we did observe that changes in pain intensity and adjustment to pain were associated with patients' pain appraisals. Still, it is possible that our findings could be explained by a regression to the mean. It is known that CPP women might seek treatment when there is a flare-up in the level of pain or when the level of pain is no longer tolerable. Over time pain intensity tends to decrease naturally, independently of the kind of diagnostics and treatments [Whitney 1992].

Second, the correlational nature of the findings between baseline pain appraisals and their changes on the one hand and improvement in pain intensity and adjustment to pain on the other hand, precludes conclusions concerning the causality of relationships between variables. For instance: the finding that an improvement in pain intensity from baseline was significantly related to a decrease in the levels of catastrophizing pain could also be valued vice versa or be explained by an interaction with another factor, for instance neuroticism [Goubert 2004].

Third, the interpretation of our findings could also be limited by the potential for non-participation bias, although the response rate in our present study of 64% is high in comparison with a 38% in the follow-up study of Lamvu [Lamvu 2006]. In addition, we could not indicate a specific reason why we found significant differences at baseline for age, living together with a partner and depression scores between participants and refusers.

Finally, the results of our present study cannot be generalized to all women with CPP as this study was conducted in a secondary referral centre, resulting in a study sample from a highly selected population. Our study sample however, was representative for a chronic pain population as the health related quality of life scores (SF-36 domains) reported by all women who were enrolled in our study, were comparable with the results in 2 other Dutch chronic pain populations in secondary and tertiary care [Swank 2003; Lamé 2005].

Nonetheless, our present results can have important implications. We showed that CPP in women who seek medical advice in secondary care, is a long-lasting condition. This knowledge should not only guide the information given to patients in clinical practice but should also facilitate the interpretation of results in treatment outcome studies. Furthermore, the impact of chronic pelvic pain on quality of life is apparent and needs attention of health care professionals [Stones 2000]. Moreover, as our findings have to be estimated as a first step to unravel an association between cognitive factors on the one hand and prognosis of CPP and adjustment to pain in CPP women on the other hand, future studies are needed to replicate our findings.

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A cognitive behavioural based assessment of women with chronic pelvic pain

7

Philomeen Weijenborg, Moniek ter Kuile and William Stones.

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ABSTRACT

From population-based surveys, chronic pelvic pain (CPP) in women is a common condition with a spectrum of associated disability and distress. Those seen by gynaecologists in a referral setting often have substantial impairment of function and mood disturbance. Because in most cases, the aetiology of CPP cannot be explained and the range of effective interventions remains limited, treatment of CPP might easily result in a sense of frustration not only for the patient but also for the gynaecologist. To avoid this situation in clinical practice, a structured assessment of women suffering from CPP using a cognitive behavioural model, is suggested. This type of assessment provides information about the impact of the chronic pelvic pain on a particular patient's daily life. It also facilitates referral for pain management. Future studies are needed to show further evidence of benefit of this approach for women with CPP.

Introduction

Chronic pelvic pain (CPP) can be defined as a constant or intermittent pain in the lower abdomen or pelvis which is not exclusively related to menstrual period (dysmenorrhoea) or sexual intercourse (dyspareunia) and which lasts for at least 3 months [Merskey 1994; Williams 2004].

Community based studies [Mathias 1996; Zondervan 2001; Grace 2004; Pitts 2008] showed variations in prevalence rates for CPP from 15% to 25%, depending on the definition of chronic pelvic pain, the study design and the measurements used. In primary care an annual prevalence rate of CPP of 3.7% is reported, comparable with figures for asthma (3.8%) and back pain (4.1%) [Zondervan 1999a]. Moreover, in a British setting only 40% of women with CPP were referred to secondary or tertiary care by their general practitioner [Zondervan 1999b]. While this relatively low rate of referral may have reflected specific features of the health care system, it is consistent with study findings from other countries [Grace 2004; Pitts 2008]. This means that gynaecologists are likely to be confronted with a selected group of all women suffering from CPP. In clinical practice, this group is recognised as being difficult to assess and treat [Grace 2000]. At the same time, women with CPP feel dissatisfied with the management of their symptoms. In their opinion, health care professionals have no genuine interest in them, and dismiss or do not believe their complaints [Price 2006].

The pathogenesis of CPP is poorly understood. Although laparoscopy is considered an essential tool to diagnose pathology, in about 40% of the laparoscopies in women with CPP no obvious explanation for the pain complaint can be demonstrated [Howard 1993]. If an abnormality such as endometriosis or adhesions, is observed, the association between the pathology and the site or severity of the pain is poor [Hammoud 2004; Fauconnier 2005; Vercellini 2007]. What is more, the same type of pathology is also noted in pain free women [Howard 1993]. If the pathology is identified, it may be coincidental rather than causal. The attribution of one physical abnormality as the only cause of CPP should therefore be interpreted with caution.
Co-morbid symptoms like dysmenorrhoea and dyspareunia [Zondervan 2001; Grace 2006; Pitts 2008; ter Kuile 2009] as well as co-morbid syndromes like irritable bowel syndrome [Whitehead 2002], interstitial cystitis [Stanford 2007], chronic fatigue syndrome and fibromyalgia [Nimnuan 2001] are frequently observed.
CPP can have a significant impact on the physical and mental health of the affected women and result in an impaired quality of life [Stones 2000]. Patients suffer from higher levels of anxiety and depression and have more sexual problems than pain free controls [McGowan 1998; Zondervan 2001; Grace 2006; ter Kuile 2009] Furthermore, some studies of women with CPP have shown that these women are more likely to have a history of physical and especially sexual abuse than women without CPP [Roelofs 2007]. In other studies this association has been less clear.

The effectiveness of medical as well as surgical treatment modalities has been investigated in randomised controlled trials and systematic review findings have been presented [Stones 2005]. Fourteen studies with satisfactory methodological quality could be identified. From these studies the conclusion could be drawn that the range of effective interventions remained limited and that recommendations for treatment were based on single studies. Results showed that progestogens (medroxyprogesterone acetate) were associated with a reduction of pain during treatment while gonadotropin-releasing hormone analogues gave a longer duration of benefit. Counselling supported by ultrasound scanning was associated with reduced pain and improvement in mood. A multidisciplinary approach was beneficial for some outcome measures. No benefits were demonstrated for adhesiolysis (unless adhesions were severe), uterine nerve ablation, sertraline or photographic reinforcement after laparoscopy. Writing about the stress of pelvic pain and the use of magnets applied to abdominal trigger points showed some evidence of short-term benefit.

A recent study [Weijenborg 2009b] demonstrated that abdominal pain persists in one out of three women two years after an acute episode of abdominal pain. It also showed that a low education level and an abuse history at a younger age (< 16 years) related to the risk of chronicity. Furthermore, no more than one out of four to five women with CPP recovered from pain at a mean follow-up period of 3 years after a variety of treatments like physiotherapeutic, psychological, medication and/or surgical treatment or expectant management between baseline and follow-up [Weijenborg 2007; Weijenborg 2009a]. None of the sociodemographic variables, pain related characteristics and/or clinical factors predicted recovery. Only a decrease in catastrophizing thoughts about pain was associated with an improvement from baseline in pain and adjustment to pain [Weijenborg 2009a]. These results were compared with findings from other studies of women with CPP and from studies of populations suffering from other chronic pain conditions like back pain or neck pain. It was concluded that CPP in women should be considered a chronic pain condition. Such a perspective could have far-reaching consequences for the assessment and management of women with CPP in clinical practice. Attention would have to be paid not only to the somatic factors associated with CPP, but also to pain adjustment (i.e., anxiety and depression and health related quality of life) and to pain appraisals (i.e., attributions and expectancies about pain) and pain coping strategies [Keefe 2004]. A so-called cognitive behavioural (CB) model for the assessment and treatment of chronic pain conditions in general [Turk 2004; Vlaeyen 2005] focuses on thoughts and feelings that are a problem for patients with persistent pain. It also comprises behaviour that makes pain, disability and distress worse [Eccleston 2009].

In this paper, we present a structured model for the assessment of women with CPP based on cognitive behavioural (CB) principles. A case history of a CPP patient is used as an example to give a step-by-step explanation. This model may facilitate referral for pain management for two categories of women. First, for those women with CPP for whom after

gynaecological examination, ultrasound investigation and/or laparoscopy, no diagnosis or somatic explanation for their pelvic pain is found. Second, for CPP patients whose complaints persist despite adequate treatment of the initial diagnosis. The model is adapted from a strategy successfully used to motivate patients for CB-treatment. These patients visited a general medicine outpatient clinic because of medically unexplained physical symptoms [Speckens 1995].

Assessment of women with CPP

Step 1. History taking about pain

History taking starts with an account of patient's pain. As in other pain conditions, the characteristics, location and description of current pain and the pattern of pain severity during the day need full attention and can be recorded using a Visual Analogue Scale (VAS) score on a scale from 0 to 10 (0 = no pain at all, 10 = worst pain imaginable). In addition, co-morbid symptoms like dyspareunia and/or dysmenorrhoea, associated bowel and urinary problems as well as other chronic (pain) conditions are assessed. Apart form the pain history, all diagnostics and treatments by previous medical specialists as well as complementary or alternative care providers, are recapitulated. The effects of these interventions on pain and on other complaints are addressed.

Case-history

35-year-old S., married with 3 children (aged 11, 7 and 5) had been suffering from pain in her pelvis and lower abdomen for 4 years. The pain first started after the birth of her youngest child. She described the pain as a nagging pain, which typically increased during the day and coincided with a bloating of the abdomen. At unexpected moments, the pain would grow worse, about 3 times a week for 1 to 5 hours, sometimes for a whole day. On average, S. would be without pain for only 2 days a month. Changes in the severity of the pain were not related to her uncomplicated micturition, defecation, menstrual period or sexual intercourse. For years, S. had also been suffering from back pain. Sometimes it was difficult to distinguish between pelvic and back pain, because the pelvic pain would radiate to the back on both sides. Especially over the weekend S. could have severe migraines lasting at least 3 days, despite medication.

Initially, the complaint was thought to be caused by a descent of the uterus. However, after an abdominal fixation of the uterus to the sacrum (sacropexy), pelvic pain persisted. Further investigations by a gastroenterologist (ultrasound, barium enema, colonoscopy), a surgeon (MRI) and urologist (cystoscopy) yielded no abnormalities. Recently, a laparoscopy was performed by her gynaecologist. After adhesiolysis of some thin adhesions the pelvic pain complaint did not change.

Table 1 *Assessment questions in case of Chronic Pelvic Pain*

Pain complaint
Amount of pain at this moment on a scale of 10 (0= no pain at all, 10=most heavy pain)
Location of pain, with radiation
Description of pain, kind of pain
Course of pain during the day
Character of pain (continuous, intermittent, exact period of time)
History of pain
Since when have you had pain complaints?
Previous diagnostics by medical doctor? If so, what were the results?
Previous treatment? If so, what were the results?
Ideas about pain
What is in your opinion the cause of your pelvic pain?
Pain coping strategies
What do you do when the pain increases?
What do you do to prevent increase of pain (medication, taking rest)?
What do you do when the pain has decreased, when you are improving?
Consequences
Cognitive:
What are your thoughts when pain exacerbates; do you worry about (the (consequences of) your pain; to what extent do you feel able to influence pain; do you feel helpless regarding your pain?
Emotional:
Do you feel anxious, depressive, irritated, annoyed, distressed, unhappy ?
Behavioural:
Do you go on with your activities despite pain or do you stop because of pain; how many prescribed and nonprescribed drugs do you use and what is the effect on pain; current or past alcohol abuse and use of other psychoactive drugs; do you visit complementary health care providers?
Physical:
Do you experience accompanying symptoms such as sweating, nausea, a high heart rate; do you feel tired or exhausted, do you experience muscle tension, is your participation in physical exercise and/ or sexual functioning affected by pain experience; can you fulfil your household duties?
Social:
Do you experience problems in your relationship with your partner, relatives or friends and/or in your job; does pain affect your participation in pleasurable activities, going on vacation?

Step 2. Ideas about pain and coping

The patient is explicitly asked about her views on the factors causing the chronic pelvic pain complaint. The patient's usual way of dealing with an increase or decrease in symptoms needs explicit attention. It is determined by pain appraisals and pain coping strategies. The term "pain appraisals" [Gatchel 2007] refers to a patient's opinions and beliefs about pain. Examples are "pain can cause damage", "activity should be avoided", "pain leads to disability" and/or "pain is uncontrollable". Catastrophizing is an important maladaptive belief often seen in chronic pain patients [Sullivan 2001; Gatchel 2007]. It comprises an exaggerated, negative mental set towards actual or anticipated pain experiences. An example is: "I cannot bear this pain any longer". The term "pain coping" covers intended behaviour or cognitions for dealing with pain, such as pain medication use, diverting attention from the pain, increasing or decreasing activity, relaxation or prayer.

Case history (continued)

Although S. had received surgical treatment for the intra-abdominal adhesions, she was still convinced that (new) adhesions were the cause of her pain. She kept wondering whether another operation would result in a solution to her chronic pain condition. An exacerbation of pain repeatedly strengthened her fears that the mesh used for the sacropexy would break down.

At this particular moment, she did not take any analgesics, because she was afraid to become addicted. Only when the pain got worse and she started sweating, felt feverish and nearly fainted as well, did she take an opioid three times a day. After such episodes, she felt exhausted and had to recuperate for days. S. was feeling powerless, because she did not know which factors contributed to an improvement or deterioration of the pain complaints.

Step 3. Consequences

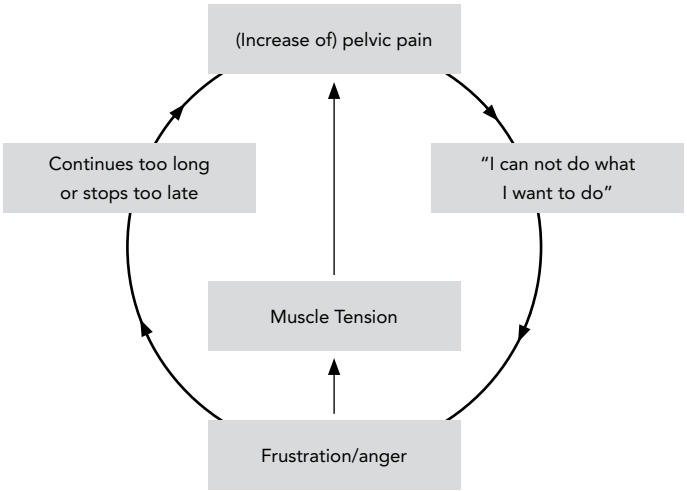
A variety of sequelae of "living in pain" are uncovered if the cognitive, emotional, behavioural, physical and social consequences are addressed. Examples of the questions that should be asked are shown in table 1. The consequences of living in pain might prolong and even worsen the complaint and become linked in self-perpetuating vicious circles. Specific patterns can be recognized in each woman suffering from CPP, even though these patterns might be subject to fluctuation within one person.

Case history (continued)

When asked, S. mentioned some of the consequences of her pain, which in turn led to more pain. This vicious circle is illustrated in Figure 1. This pattern emerges when patients have "non accepting thoughts about pain" and is frequently observed in women with CPP.

When S. experienced more severe pain, she felt burdened by her pain. She did not accept that the pain influenced her everyday life to such an extent and as a result was angry. In its turn, this anger caused tension everywhere in her body and had a negative effect on the level of experienced pain. With great effort, she succeeded in fulfilling her regular household duties but still she was convinced that she failed as a partner and mother. When the pain obliged her to rest, she blamed herself for her inactivity. As soon as the symptoms improved, she would resume her activities and would try to catch up on lost time. Subsequently, the pain might increase as a result of over-exertion.

Figure 1 *"Non accepting thoughts about pain"*
An example of a vicious circle between cognitive, emotional, behavioural, physical and social consequences and Chronic Pelvic Pain



Case history (continued)

The next example of a vicious circle is shown in figure 2. Now the focus is on "anxious thoughts about pain and associated avoidance behaviour". This circle is easily activated when pain exacerbates. The fear that something might be seriously wrong can result in a renewed search for medical help.

S. was convinced that she could no longer do anything because of the pain. She was anxious and over-concerned and was convinced that serious damage to her abdomen caused the increase of pain. S. tried to avoid all activities in order to prevent this expected intensification. She even gave up s her job as a secretary and withdrew from social events. No longer distracted from her pain, S. concentrated her attention on all

bodily sensations (in other words manifested hypervigilance) and this affected her pain experience in a negative way. Consequently, in the long term, disuse resulted in a loss of physical fitness and disability, weight gain and depressive symptoms.

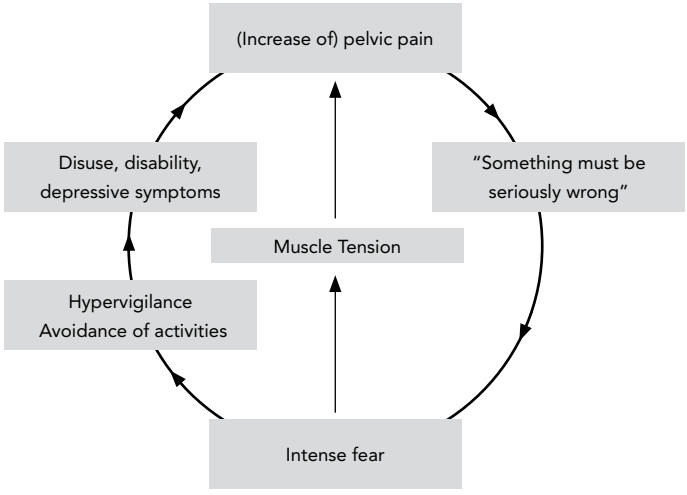
Step 4. Reorientation

Where appropriate, the findings of the consultation and further examinations are summarized. Thereafter, specific points are communicated to the patient.

First, an explanation of current views on chronic (pelvic) pain is given. "Being in pain" is an unpleasant sensory and emotional, thus subjective experience [Merskey 1994]. An objective quantification of the severity of pain experienced by the patient is impossible, but the consequences of CPP for everyday life illustrate the impact and burden of these complaints. Moreover, the patient is informed that only a minority of patients suffering from CPP will recover over time, taking a narrow definition of recovery as complete relief of pain.

Second, further examinations are considered to be of minor value because each imaging investigation or invasive technique evaluates only the shape or size of the internal organs. If an abnormality is diagnosed, it is judged coincidental rather than causal. That the cause of CPP cannot be explained properly is "bad news" and might lead to deterioration of the patient's condition because her expectations of a specific diagnosis and subsequent medical solution for her pain are not met.

Figure 2 *"Anxious thoughts and avoidance behaviour". An example of a vicious circle between cognitive, emotional, behavioural, physical and social consequences and Chronic Pelvic Pain*



Third, by recapitulating the medical aspects and psychosocial consequences of the patient's complaint, the gynaecologist expresses and demonstrates his or her genuine interest in and acknowledgment of the patient and her pain. Using one of the vicious circles as an example, the gynaecologist can explain how the consequences of pain in every day life can prolong and even worsen her pain.
Fourth, at this stage the patient is given the opportunity to re-orientate her thinking about chronic pain. She is encouraged to change her view from the former dualistic biomedical way of thinking which she has previously internalised, towards a multidimensional biopsychosocial perspective.

Case history (continued)

S. recognized herself in the summary of her pelvic pain history, current pain experience and the impact of the pain on every day life. She realized that her thinking about her complaints and her management of the pain might influence her pain experience. However, she was really disappointed to hear that further surgical treatment for her adhesions would not be provided although other specialists had already informed her similarly. It was difficult for her to give up her quest for this supposed cure. It became clear that S. needed time to reconsider her former beliefs and to internalise the new perspective.

Step 5. Pain management

If the patient is willing to identify with and accept the cognitive behavioural model as presented above, the gynaecologist is in a position to explain what can be achieved with pain management approaches based on this broad model. Referral to a cognitive behavioural psychologist with special chronic pain expertise is recommended for evaluation of the condition. This evaluation should include identification of psychological co-morbidity such as anxiety and depressive disorders or other psychopathology as well. In this way, it is possible to tailor pain management to the needs of a particular patient. This approach aims to alleviate the impact of pain on daily life. A combination of medical (pain medication), physical (functional restoration; graded activity) and psychological modalities can be offered (such as goal setting, problem solving, relaxation training, development of effective coping strategies, changing maladaptive beliefs about pain and graded exposure to stimuli that may generate pain). Medical consultation has to continue on a regular basis during treatment to provide support for the pain management programme and to preempt any perception of feeling dismissed. If complaints should increase at a given point in time, a thorough medical examination remains mandatory, as some underlying conditions such as endometriosis can manifest new symptoms

Case history (continued)

After repeated consultations, S. accepted the offer to visit a CPP team and to be assessed by a psychologist. The results of self-report measures on pain, adjustment to pain and pain appraisals and coping strategies endorsed the burden of her chronic pelvic pain condition. They indicated high scores for depressive symptoms and impaired physical health. She also coped ineffectively with pain with a tendency to catastrophize pain. S. started pain management and received psychological treatment. Gradually, she realized that it would take time to get a better life despite her chronic pelvic pain. At a follow-up, 2 years thereafter, S. still suffered from pelvic pain complaints, but the impact of pain on her life had decreased substantially. She had found a new balance between rest and activity. She no longer felt depressed and had started a new job on a part-time basis.

Discussion

In clinical practice, the use of a model based on cognitive behavioural principles for the assessment of chronic pelvic pain patients as presented here, has great advantages for the gynaecologist as well as the patient. The model provides the gynaecologist with an elegant and sufficiently inclusive method of understanding patients' symptoms and their impact on everyday life. Furthermore, the patient feels that her pain is taken seriously because not only the physical aspects are addressed but also her concerns, her thoughts and her ways of coping with pain. In addition, by labelling the pain related sequelae as consequences rather than as potential etiological agents, the gynaecologist can avoid fruitless discussions about the causality of diverse somatic or psychological factors. This CB-based assessment is one of the strategies [Jensen 2002] to motivate the patient for pain management referral and can be applied by each gynaecologist dealing with CPP patients.

Additionally, other specific questions are of interest and need further study. For instance, the health service issues arising from the need to devote more time than is allotted to a normal consultation when using this model. What should be the appropriate management pathway for patients who insist on further medical treatment to the exclusion of psychological intervention? How to cope with patients' stated or unstated inappropriate ideation about chronic pain based on the traditional biomedical view, for example that extreme pain indicates pathology? And how can practitioners best be equipped to handle the emotional challenges arising from interactions with patients?

Conclusion

The step-by-step assessment proposed, based on cognitive behavioural principles as presented in this paper, provides information about the impact of the chronic pelvic pain on the daily life of women with CPP. It takes time to help the patient change her perspec-

tive on chronic pain. Simultaneously, the use of a structured CB model facilitates referral for pain management. Further research is needed to study the benefits of this model for women suffering from CPP.

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Women in PAIN

Summary, discussion and future perspectives

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This thesis aims to give insight into some diagnostic aspects and the clinical course of pelvic pain in women. We evaluated the reliability of videotaped compared to real-time laparoscopy and investigated the moderating and/or mediating factors of sexual functioning in women suffering from CPP. Further, we focused on the course of acute abdominal pain and predictors of pain persistence. We also evaluated the course of chronic pelvic pain and possible predictors of recovery from pain. Finally, we suggested a method for assessment of women with CPP that could be beneficial for pain management.

This chapter summarizes the main results of our studies, discusses our findings in the light of our research questions and compares the results with previous reports in literature. Thereafter, we address the limitations of our studies and discuss which implications our results have for clinical practice and future research.

The main results of our studies can be recapitulated as follows:
We observed (*chapter 2*) that for endometriosis scorings the evaluations of videotaped laparoscopies were reliable. However, special attention must be given to the assessment of ovarian lesions because observers tended to disagree on the severity and extent of ovarian endometriotic disease. As a result of the high number of disagreements between the scorings of adhesions during real-time and videotaped laparoscopies, we concluded that videotaped laparoscopies were not reliable to assess adhesions properly.

Furthermore, in concordance with the results in other studies [Mathias 1996; Collett 1998; Zondervan 2001; Grace 2004; Verit 2006; Florido 2008; Pitts 2008] more sexual problems were reported by women with CPP in comparison with pain free controls (*chapter 3*). Sexual abuse, anxiety and depression were associated with sexual problems in all women, but given that women with CPP recorded more anxiety and depression than controls did, they stated more sexual problems. A sexual abuse history was a non-specific predictor of sexual functioning.

Considering the studies on the course of abdominal and pelvic pain, we demonstrated that abdominal pain persisted in one out of three women 2 years after an *acute* episode of abdominal pain (*chapter 4*). Pain persistence was only associated with a low education level and an abuse history < 16 years of age, but not with any of the other sociodemographic variables or pain related characteristics. We also found that suffering from CPP was associated with impaired quality of life (*chapter 3 - 6*). No more than one out of four to five women with *chronic* pelvic pain recovered from pain over time (*chapter 5 and 6*). Furthermore, only a decrease in catastrophizing thoughts about pain was associated with an improvement from baseline in pain and adjustment to pain, whereas other psychological factors were not related to recovery from CPP complaints (*chapter 6*). Moreover, none of the sociodemographic variables, pain related characteristics and/or clinical factors predicted recovery (*chapter 5 and 6*).

Comparing our results with findings from other studies, we note remarkable similarities. First, pain persistence after an acute episode of abdominal pain was not only demonstrated in our sample of women but also in women after Pelvic Inflammatory Disease (PID) [Haggerty 2005], in patients with non-specific abdominal pain (NSAP) [Jess 1982] and in women with NSAP in the right hypogastric area [Morino 2006]. Our study results showed that 30% of the women reported a continuation of pain symptoms. A similar percentage of pain persistence is noticed in women after Pelvic Inflammatory Disease (36%) and a somewhat lower percentage in patients with NSAP (16% and 20% respectively). In other pain conditions such as acute neck and back pain the percentages of patients who develop chronic pain after an acute episode, have a wide range varying form 3% to 70% dependent on the population studied, the design and the measurements used [Hestbaek 2003; Pengel 2003]. Moreover, physical and psychological risk factors for a continuation of pain have been studied, especially in neck and back pain. Findings highlight the importance of psychological factors like anxiety, depression and cognitive variables [Linton, 2000; Williamson 2008] but do not support physical factors such as injury characteristics [Harris 2007] as important contributors to future pain.

Second, our studies revealed that only a minority of women with CPP recovered from pelvic pain. This phenomenon is also observed in studies on the course of chronic pain conditions in general like in chronic back pain [Pengel 2003] and late whiplash syndrome [Hendriks 2005; Kamper 2008]. That our recovery rate of a maximum of 25% at a 3 years' follow-up was relatively low in comparison with the report of a 46% improvement in women with CPP 1 year after they visited a CPP specialty clinic [Lamvu 2006], is probably due to differences in the definition of improvement, the composition of the study sample and the kind of measurements used. In line with our results, Lamvu's study also reported that sociodemographic, clinical or pain related variables did not predict recovery. In studies on the course of other chronic pain conditions such as back pain [Hestbaek 2003; Mallen 2007], late whiplash syndrome [Scholten-Peeters 2003; Kamper 2008] and irritable bowel syndrome [Janssen 1998] findings are similar.

Third, the association between chronic abdominal and pelvic pain in women on the one hand and higher levels of anxiety and depressive symptoms and lower levels of health related quality of life on the other hand, is not only observed in our 4 studies but also indicated by others [Savidge 1997; Stones 2000] investigating pain related physical and mental health in women with CPP. A similar impact of chronic pain on adjustment to pain is demonstrated in patients with chronic abdominal pain and adhesions [Swank 2003] and in patients from pain specialty clinics suffering from all kinds of chronic pain conditions [Lame 2005].

Finally, the potential role of (changes in) catastrophizing associated with pain experience and adjustment to pain as illustrated in one of our studies, is thoroughly demonstrated in experimental and clinical studies in diverse patient groups suffering from acute and chronic pain [Sullivan 2001] as well as in treatment outcome studies in patients suffering

from for instance chronic low back pain [Spinhoven 2004], chronic pain in general [Jensen 2001] and fibromyalgia [Nielson 2004].

Subsequently our main conclusion is that CPP in women has to be considered as a chronic pain condition in general. Such a perspective might have far reaching consequences on the assessment and management of women with CPP in clinical practice. As in other chronic pain conditions, attention has to be paid not only to the somatic factors associated with CPP but also to pain adjustment (i.e., anxiety and depression and health related quality of life) as well as to pain appraisals and pain coping strategies [Keefe 2004].

Therefore, in *chapter 7* we presented a vignette of a woman suffering from CPP and explained step-by-step the use of a structured model in the assessment of such a patient. Such model, based on cognitive behavioural principles, deals not only with pain (e.g., duration, course, severity, character), but also with the patient's view of (the cause of) the complaint and the way the patient deals with her complaints. Further, the sequelae of living in pain are explored focusing on the cognitive (e.g., pain appraisal, catastrophizing thoughts, perceived pain control), emotional (e.g., anxiety and depressive symptoms), behavioural (e.g., over- or underactivity, medication use), physical (e.g., tiredness, sexual dysfunction, eating or sleepproblems) and social consequences (e.g., sick leave, social isolation, family problems). In this way pain related distress and disability become apparent. It was discussed that, as in chronic pain conditions in general, pain management of CPP should focus primarily on improving observed disability and distress which in the end might result in pain reduction.

Limitations

The studies in this thesis have a number of limitations and methodological concerns that already have been discussed in the discussion sections of the respective chapters. Two important issues, the external validity and the correlational nature of the findings, will be discussed below in more detail.

The external validity [Dekkers 2009] of our findings could be limited by the setting from which the study samples were retrieved. However, there are indications to assume that the results of our study about the course of acute abdominal pain performed in a secondary care medical center, can be generalized to the whole population of women with acute abdominal pain. In concordance with our study, a similar 30% of a population-based cohort suffering from acute pain reported pain persistence at a 6 months follow-up [Leiknes 2007]. In addition, the samples of women with CPP eligible for the case-control study about sexual functioning and for the follow-up studies, were selected from all women who had visited the CPP-team of the LUMC, a tertiary referral centre. We estimate that our results are also valid for a gynaecological department in secondary medical care as the baseline characteristics reflected in levels of pain and adjustment to pain, did not differ between women enrolled in our study and people suffering from abdominal pain who were assessed in a Dutch secondary medical care setting [Swank 2003].

In addition, specifically in the 3 follow-up studies the interpretation of results could have been limited by the potential for non-participation bias. However, in these studies we used a similar way to ask former patients to participate in the studies and the response rates across studies were comparable, respectively 58% (*chapter 4*), 60% (*chapter 5*) and 64% (*chapter 6*). Regarding sociodemographic, clinical and pain related variables no remarkable differences were found between study participants and refusers, except for one item. In comparison with those who refused to participate, a significantly larger percentage of study participants reported to have had a surgical intervention as a consequence of their diagnosis made at the emergency department. Moreover, participants reported more visits to other medical specialists and gynaecological surgical interventions before attending the CPP team than refusers. The reason for this difference is still unclear, although it can be suggested that treatment offered in the past has influenced the willingness to consent in a follow-up study.
Finally, because the control group used in the case-control study on sexual functioning consisted of women who responded to an advertisement in a local newspaper, we are not sure whether this sample is representative for women of the Dutch population without pelvic pain. However, their responses on the questionnaires for physical impairment, anxiety and depression were comparable with the norms of the control groups for the specific measures we used.
All in all, after this reflection on various factors involved in the assessment of the external validity of our studies, we conclude that our results can be generalized to women suffering from acute abdominal or chronic pelvic pain other than the study populations used.

The correlational nature of the findings between outcome (chronicity, recovery or improvement in pain intensity) and sociodemographic, clinical and pain related variables at baseline found in our follow-up studies (*chapter 4-6*) precludes conclusions concerning the causality of relationships between these variables. The same is true for the association between sexual function and anxiety and depression as observed in our case-control study (*chapter 2*). For instance, one of our follow-up studies showed that a decrease in pain intensity between baseline and follow-up in women with CPP was significantly related to a decrease in the levels of catastrophizing pain, but it could also be that the latter change was a consequence of the pain alleviation over time or that the decrease in pain severity could be explained by an interaction with another factor such as neuroticism [Goubert 2004]. Also as another example, we observed that the report of sexual abuse experiences at a younger age was associated with a perpetuation of abdominal pain following an acute episode. However, it is also possible that the development of a chronic pain condition is a result of a higher vulnerability of a person, caused by early trauma associated changes in cortisol levels [Gatchel 2007].

Clinical implications and further research

The results of our studies regarding the diagnostic aspects and the course of acute abdominal and chronic pelvic pain have clinical implications and encourage further research.

Regarding the reliability of videotaped laparoscopies, the results indicate that in case of endometriosis apart form ovarian lesions, the use of videotaped laparoscopies is justified. With regard to adhesions, the evaluations during videotaped laparoscopy are not reliable and therefore these evaluations should be interpreted with caution. Subsequently, if advice on any surgical consequence of findings is warranted, repeated surgery i.e. performance of a diagnostic laparoscopy may be sometimes necessary. In addition, studies are required to improve internal consistency between measurements in order to score adhesions properly.

When sexual functioning is addressed in women with CPP, one has to bear in mind that sexual problems are more strongly associated with pain related psychological variables as depression and anxiety and to a lesser degree with somatic pain characteristics such as pain severity and physical impairment. In addition, women with CPP report more sexual problems because they have higher levels of anxiety and depression than women without pain. These findings indicate that gynaecologists have to assess not only the somatic aspects of CPP but also the presence of anxiety and depressive symptoms. In subsequent treatment these factors have to be accounted for. Furthermore, in our study the percentages of women who reported a sexual abuse history are similar in women with as well without pelvic pain. And also, such a history is associated with sexual problems in all women, irrespective of CPP suffering. This result implies that sexual abuse does not play a specific role in the report of sexual problems by women with CPP but that it represents an important factor in the development of sexual disfunctions in women with and without CPP.

The clinical consequences of our main conclusion that chronic pelvic pain can be considered as a chronic pain condition in general, have been demonstrated in chapter 7 addressing the assessment of women with CPP. Our findings about the clinical course of acute abdominal or chronic pelvic pain and its predictors of outcome (i.e.,persistence or recovery) can be valuable information for health care providers and patients [Croft 2006]. Other implications for clinical practice need further research in women with CPP, based on what is known from studies in other chronic pain conditions.
Because data about the clinical course and prognosis of acute pain and about the risk factors for persistence of pain may lead to early identification of patients at risk for the development of chronic pain after an acute episode [White 1997], new prospective studies are needed in a population of women suffering from acute pelvic pain. Moreover, future studies have also to elucidate the potential role of catastrophizing pain in pain persistence or recovery from pain. Further knowledge about predictors of recovery from or continuation of pain will increase our understanding of women suffering from pain in the pelvic region. Thereafter, appropriate interventions could be elaborated to reduce risks for pain persistence after an acute episode or to enhance recovery from chronic pelvic pain.

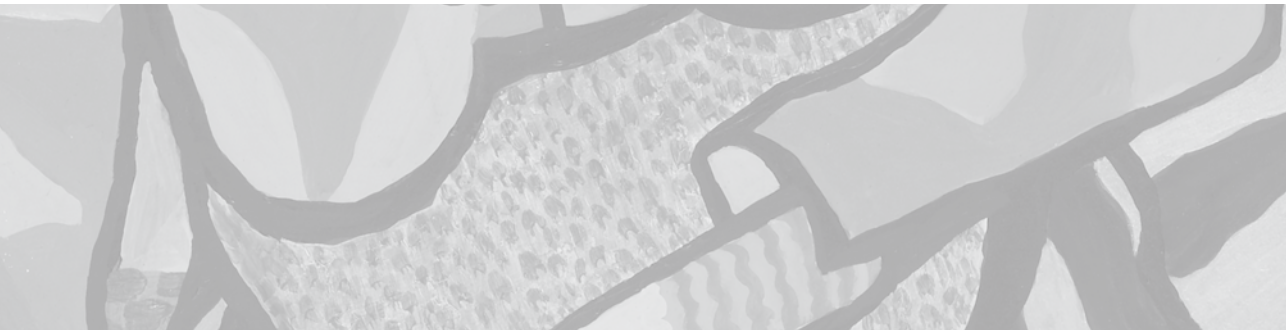
Furthermore, we have characterized women suffering from CPP with special attention for not only the somatic factors associated with CPP but also to adjustment to pain (anxiety

and depressive symptoms and health related quality of life) as well as to important psychological factors (i.e., pain appraisals and pain coping strategies) [Gatchel 2007]. These findings underline a biopsychosocial perspective on chronic pain and should guide the development of interventions focused not only on improvement of pain but also on distress and disability. Future treatment outcome studies in chronic pelvic pain in women need to use standardized measurements for the assessment of this outcome [Dworkin 2005].

Finally, considering chronic pelvic pain as a chronic pain condition in general, implementing current and future research topics from the field of chronic pain [Gatchel 2007] is warranted. Noteworthy developments in this field cover for instance basic neuroscience processes of pain and studies on the interaction between chronic pain related psychological factors and brain processes.

Women in PAIN

Nederlandse samenvatting



Een vrouw krijgt de diagnose 'chronisch buikpijn' (CBP) wanneer zij minstens 3 opeenvolgende maanden incidenteel of continu last heeft van buikpijn[1]. In dit proefschrift wordt met name ingegaan op pijn in de onderbuik, die niet alleen toegeschreven kan worden aan de menstruatie (dysmenorroe) of aan seksuele activiteit (dyspareunie).

Hoofdstuk 1: Inleiding

In de algemene bevolking rapporteert 15 tot 25 procent van alle vrouwen desgevraagd klachten van pijn in de onderbuik, die langer dan 6 maanden bestaan. Van alle vrouwen die jaarlijks een huisarts bezoeken, meldt 3.7 procent last te hebben van dergelijke buikpijnklachten, een percentage dat vergelijkbaar is met jaarcijfers voor astma (3.8%) en rugpijn (4.1%). Slechts 40 procent van deze vrouwen wordt verwezen naar een medisch specialist. Gynaecologen zien in hun spreekkamer dus een selecte groep van alle vrouwen met langdurige pijnklachten in de onderbuik.

Bij een consult vanwege CBP wordt een anamnese afgenomen, wordt lichamelijk onderzoek uitgevoerd en indien nodig vervolg-onderzoek ingezet zoals laboratorium bepalingen, echografie, CT-scan of MRI. De meest voorkomende gynaecologische verklaringen voor CBP zijn endometriose[2] en adhesies (verklevingen). Om deze afwijkingen adequaat te kunnen vaststellen, is het meestal noodzakelijk een diagnostische laparoscopie (kijkoperatie) te verrichten. Uit onderzoek komt echter naar voren dat bij ongeveer 40 procent van de vrouwen met CBP tijdens laparoscopie geen pathologie wordt gevonden die de klachten zou kunnen verklaren. Wanneer wel een afwijking wordt gezien, blijkt deze bovendien lang niet altijd samen te hangen met de ernst of met de lokalisatie van de pijn. Ook kan een afwijking gevonden worden bij vrouwen zonder buikpijn. Kortom, wanneer met laparoscopie bij een vrouw met CBP een afwijking wordt vastgesteld, is dit vaker een toevalsbevinding dan een verklaring voor haar klachten.

Veel vrouwen met CBP worden fysiek en mentaal gehinderd door hun klachten, wat leidt tot een verminderde kwaliteit van leven vaak in combinatie met relatief hogere scores op angst en depressieve klachten. Ook rapporteren zij meer lichamelijke beperkingen en meer seksuele problemen dan vrouwen zonder pijn. Daarbij melden vrouwen met CBP ook vaker dan vrouwen zonder pijn, dat zij in het verleden seksueel en fysiek misbruikt zijn.

Het effect op pijn van zowel medicamenteuze als chirurgische behandelingen bij CBP vrouwen is in verschillende onderzoeken geëvalueerd. Uit een recent systematisch overzicht van deze studies kwam naar voren dat slechts een enkele behandeling effectief was. Ook kon niet vastgesteld worden welke behandeling het meest effectief was om pijnklachten te verminderen, omdat de onderzochte behandelingen sterk verschilden.

1 Dit kan pijn zijn in de onderbuik, in het Engels 'pelvic pain' genaamd. Het kan ook gaan om pijn in zowel onder- als bovenbuik ('abdominal pain').

2 Endometriose is een goedaardige aandoening waarbij de binnenbekleding van de baarmoederholte, het baarmoederslijmvlies of endometrium, ook buiten de baarmoeder aanwezig is, bijvoorbeeld in het ovarium (de eierstok) of op het peritoneum (buikvlies).

In dit proefschrift wordt in hoofdstuk 2 het resulaat beschreven van onderzoek naar de betrouwbaarheid van bevindingen tijdens laparoscopie die vastgelegd zijn op een videoband. Het seksueel functioneren van vrouwen met CBP is onderwerp van hoofdstuk 3. In de daarop volgende hoofdstukken 4, 5 en 6 wordt het klinisch beloop van buikpijn klachten nader toegelicht. Tot slot bespreken we in hoofdstuk 7 een methode om vrouwen met CBP in de spreekkamer te bevragen over hun klachten.

Alle vrouwen met CBP die aan deze studies hebben deelgenomen, werden bij hun bezoek aan de polikliniek Gynaecologie van het Leids Universitair Medisch Centrum (LUMC) door hun behandelend gynaecoloog verwezen naar het zogenaamde Chronisch Buikpijn Team (CBP-team). Dit team bestaat sinds eind jaren '80 van de vorige eeuw en heeft in de loop van de jaren veel ervaring opgebouwd in de diagnostiek en behandeling van vrouwen met CBP. Zowel regionaal als supra-regionaal wordt door huisartsen en medisch specialisten naar dit team verwezen.

Hoofdstuk 2: Het evalueren van de betrouwbaarheid van beoordelingen van afwijkingen, gevonden tijdens laparoscopie en vastgelegd op videoband.
De laatste jaren is zowel in de gynaecologische praktijk als bij andere snijdende specialismen het gebruik van laparoscopie bij diagnostiek en behandeling enorm toegenomen. Steeds vaker worden de bevindingen vastgelegd op beeld (video of dvd) om zo bijvoorbeeld de patiënte te kunnen informeren, een second opinion te ondersteunen of de opleiding van AIOS (Assistenten In Opleiding tot Specialist) te faciliteren. Het is van belang dat bij (her)beoordeling van dergelijk beeldmateriaal, de bevindingen overeenkomen met datgene wat gezien is tijdens 'real-time laparoscopie'.
In dit onderzoek worden de beoordelingen tijdens real-time laparoscopie bij een heterogene groep vrouwen (namelijk vrouwen die een kijkoperatie ondergingen vanwege chronische pijnklachten in de onderbuik, vanwege een verzoek tot sterilisatie of voor een fertiliteitsonderzoek) vergeleken met de beoordelingen van een video-opname van die laparoscopie. Op een systematische manier is de aanwezigheid van endometriose en adhesies gescoord en een totaalscore berekend als maat voor de ernst van de afwijking. In totaal zijn 90 video-opnames voorgelegd aan zowel de oorspronkelijke operateur (intra-beoordelaars betrouwbaarheid) als aan een collega (inter-beoordelaars betrouwbaarheid).
Wanneer de beoordelaars hun eigen video-opname dan wel die van een ander beoordeelden, bleken zij in sterke mate overeen te stemmen (κ = 0.75) als het erom ging of endometriose aanwezig was, en zo ja: in welk stadium. De beoordelaars vonden echter weinig overeenstemming wanneer het endometriose in de eierstok (het ovarium) betrof. Vervolgens bleken de intra- en de inter-beoordelaarsbetrouwbaarheid respectievelijk matig (κ = 0.38) tot gemiddeld(κ = 0.55) waar het ging om de vaststelling van adhesies. In beide situaties werd ook weinig overeenstemming gevonden in de beoordeling van de ernst van de gevonden afwijking. Tot slot bleek dat operateurs niet systematisch hoger of lager scoorden wanneer ze een eigen video-opname, of die van een ander beoordeelden.
De resultaten van dit onderzoek tonen aan dat video-opnames van afwijkingen gevonden

bij laparoscopie, betrouwbaar zijn wanneer het gaat om het vaststellen van endometriose, behalve wanneer het ovariële endometriose betreft. De beoordeling van adhesies op een videoband blijkt onbetrouwbaar te zijn. Voor de klinische praktijk betekent deze laatste bevinding dat men terughoudend moet zijn met een eventueel advies over chirurgisch ingrijpen bij adhesies op basis van een video-opname. In een voorkomende situatie zou het noodzakelijk kunnen zijn om opnieuw een laparoscopie uit te voeren.

Hoofdstuk 3: Seksueel functioneren van vrouwen met CBP; de rol van angst en depressie.
Omdat bekend is dat vrouwen met CBP meer seksuele problemen, meer angst en depressieve klachten en vaker een seksueel geweldsverleden rapporteren dan vrouwen zonder buikpijn, wordt in dit onderzoek nagegaan in hoeverre de samenhang tussen buikpijn en seksuele problemen beïnvloed wordt door angst, depressie en een geweldsverleden. Het seksueel functioneren van 154 vrouwen met CBP is vergeleken met dat van 58 vrouwen zonder buikpijn. Alle vrouwen hebben zelf een aantal vragenlijsten ingevuld.
Vrouwen met CBP rapporteerden meer seksuele problemen, meer angst en depressieve klachten en meer lichamelijke beperkingen in het dagelijks leven dan de gezonde controles. In de totale groep van vrouwen werd de ernst van seksuele problemen met name bepaald door de mate van angst en depressie en niet door de (ernst van de) pijn en de lichamelijke beperkingen. Verder werd in de groep vrouwen met CBP geen samenhang gevonden tussen seksueel disfunctioneren enerzijds en de duur van de pijnklachten, het aantal chirurgische ingrepen en/of de diagnose anderzijds. Bij nadere analyse werd duidelijk dat zowel angst als depressie significant (en onafhankelijk van elkaar) invloed hadden op de relatie tussen pijn in de onderbuik en seksuele problemen, nadat gecontroleerd was voor seksueel geweld. Ongeveer 35 procent van de vrouwen in beide groepen (dus in de pijn- én in de controlegroep) meldde een verleden van seksueel geweld. Bij nadere analyse bleek dit een niet-specifieke voorspeller van seksuele problemen te zijn.
Uit de resulaten van dit onderzoek valt te concluderen dat seksueel geweld, angst en depressie gerelateerd zijn aan het vóórkomen van seksuele problemen bij alle vrouwen - of ze nu pijn in de onderbuik hebben of niet. Doordat vrouwen met CBP echter meer angst en depressieve symptomen ervaren dan controle vrouwen, rapporteren zij meer seksuele problemen.

Hoofdstuk 4: Het beloop van acute buikpijn bij vrouwen en het voortduren van de pijn.
In dit hoofdstuk zijn de resultaten beschreven van een vervolgonderzoek onder 115 vrouwen die vanwege acute buikpijnklachten (met een duur van minder dan 7 dagen) een SEH (Spoedeisende Eerste Hulp) van een algemeen opleidings-ziekenhuis bezochten. Er is nagegaan in hoeverre vrouwen na een dergelijke acute episode van buikpijn bij follow-up nog pijn rapporteerden en welke factoren daarbij een rol speelden. Alle vrouwen vulden zelf een aantal vragenlijsten in.
Bij een gemiddelde follow-up duur van 2 jaar, meldde 30 procent van de vrouwen nog buikpijnklachten te hebben gehad gedurende meer dan 3 maanden in het voorafgaande jaar. Deze chronische pijn-groep ondervond bij follow-up meer lichamelijke beperkingen

dan de groep vrouwen zonder pijn. Met name een laag opleidingsniveau en geweld op jongere leeftijd (vóór het 16e jaar) bleken onafhankelijke risicofactoren te zijn voor het ontwikkelen van chronisch buikpijn. Geen enkele andere sociodemografische factor hing samen met het voorduren van de pijn. Deze chronische pijn kon evenmin in verband gebracht worden met een geschiedenis van buikpijn, een abdominale chirurgische ingreep voorafgaande aan het SEH bezoek, de uiteindelijke diagnose die op de SEH gesteld werd, noch met een eventueel daaruit voortvloeiende operatie.
De resulaten van dit onderzoek hebben duidelijk gemaakt dat bijna 1 op de 3 vrouwen met acute buikpijn, twee jaar later nog buikpijnklachten heeft. Dit aanhouden van pijn hangt samen met een laag opleidingsniveau en geweld op jongere leeftijd.

Hoofdstuk 5: Het beloop van chronisch buikpijn bij vrouwen
In dit onderzoek is de aandacht gericht op het klinisch beloop van chronische buikpijnklachten, en op het herstel van pijn in de loop van de tijd bij vrouwen met CBP. Bij 72 vrouwen met CBP werd bij follow-up een Life Chart Interview afgenomen. In een dergelijk interview wordt de herinnering aan (de ernst van de) pijn getriggerd door deze te koppelen aan belangrijke persoonlijke gebeurtenissen in het leven van de vrouw, zoals een specifieke verjaardag, een verhuizing, een bepaalde baan of een overlijden. Alle vrouwen vulden ook zelf een aantal vragenlijsten in.
Bij een gemiddelde follow-up duur van 3 jaar was 25 procent van de vrouwen uit de onderzoeksgroep hersteld, dat wil zeggen dat zij minder dan drie maanden in het voorafgaande jaar pijn in de onderbuik rapporteerden. Elf procent van alle vrouwen meldde helemaal geen buikpijnklachten meer. Er werd geen samenhang gevonden tussen het gevonden herstel en de sociodemografische kenmerken. Ook was er geen verband met de klinische gegevens (zoals het aantal bezoeken aan een specialist en het aantal ingrepen) en pijngerelateerde factoren (zoals de duur van de pijn) ten tijde van het bezoek aan het CBP-team. Evenmin was er een relatie met de diagnose of de behandeling tussen het bezoek aan het CBP-team en de follow-up meting.
Met dit onderzoek is duidelijk geworden dat CBP een langdurige klacht is waarvan slechts één op de vier vrouwen in de loop der tijd herstelt. Er zijn geen specifieke factoren vastgesteld die samenhangen met een dergelijk herstel.

Hoofdstuk 6: Het beloop van chronisch buikpijn bij vrouwen en voorspellers van herstel.
In dit onderzoek is opnieuw gekeken naar het klinisch beloop van chronisch pijnklachten in de onderbuik, waarbij een mogelijke rol van psychologische factoren bij het herstel is geëvalueerd. Een groep van 84 vrouwen met CBP nam deel aan het onderzoek en vulde zelf een aantal vragenlijsten in.
Bij een gemiddelde follow-up duur van 3 jaar werd een duidelijke verbetering in de ernst van de pijn en in de kwaliteit van leven vastgesteld. Twintig procent van de vrouwen met CBP bleek hersteld te zijn van de pijn, terwijl 8 procent aangaf helemaal geen pijn meer te hebben. De gehele groep vrouwen catastrofeerde minder en gaf aan meer controle over de pijn te hebben. Sociodemografische kenmerken en pijn-gerelateerde factoren hingen

niet samen met pijnvermindering. Ook de klinische gegevens zoals het aantal en het soort dokters die de vrouwen met CBP bezochten, het aantal en het soort behandelingen (medisch, chirurgisch of psychologisch) dan wel een diagnose van endometriose of adhesies, voorspelden de gevonden vermindering in pijn niet. Evenmin werd pijnvermindering bij follow-up voorspeld door de wijze waarop de vrouw bij aanvang dacht over de pijn, en of zij een gevoel van controle had over (de gevolgen van) de pijn. Wel bleek dat een vermindering in catastroferend denken over pijn samenhing met een vermindering van pijn, van depressieve klachten en van fysieke beperkingen.
Deze resultaten bevestigen opnieuw het chronische beloop van chronische pijnklachten in de onderbuik. Tevens is duidelijk geworden dat alleen een vermindering van catastroferende gedachten over de pijn, samenhangt met een vermindering van pijn en de aanpassing aan pijn. Andere psychologische variabelen hebben geen invloed op deze uitkomst op langere termijn.

Beschouwing en implicaties voor de praktijk

Wanneer we de resultaten van deze onderzoeken vergelijken met die van andere (follow-up) studies in populaties van vrouwen met pijn in de onderbuik en met andere chronische pijnklachten, dan zijn de overeenkomsten opvallend.
Ten eerste is het voortduren van pijn na een acuut moment van buikpijn niet alleen in ons cohort van vrouwen gevonden, maar ook bij vrouwen na PID (Pelvic Inflammatory Disease ofwel eileiderontsteking) en bij patiënten met 'niet-specifieke buikpijnklachten'. Wij vonden dat 30 procent van de vrouwen op de langere termijn nog buikpijnklachten rapporteerde. Vergelijkbare percentages van chroniciteit na een acute episode zijn ook vastgesteld bij vrouwen na PID (36 procent) en bij patiënten met niet-specifieke buikpijnklachten (ongeveer 20 procent). Wanneer het andere chronische pijnklachten betreft zoals nek- en rugpijn, variëren de percentages van mensen die klachten blijven houden van 3 tot 70 procent. Dit percentage is afhankelijk van de kenmerken van de onderzoekspopulaties, de opzet van de studies en de gebruikte meetinstrumenten. Studies in deze pijnpopulaties hebben ook laten zien dat psychologische factoren zoals angst, depressie en catastroferen over pijn sterker samenhangen met het voortbestaan van pijn na een acute episode dan medische factoren.
Ten tweede vonden we dat slechts 25 procent van de vrouwen met chronische pijn in de onderbuik herstelde van de pijn. Dergelijke bevindingen worden ook gerapporteerd in onderzoeken naar het beloop van chronische pijnproblemen in het algemeen, zoals chronische rugpijn en whiplash syndroom. Vergeleken met een ander onderzoek in een populatie van vrouwen met chronische buikpijn was ons herstelpercentage lager (46 procent versus 25 procent). Dit is mogelijk toe te schrijven aan een verschil in opzet en uitvoer van de twee studies. In beide onderzoeken werd herstel niet voorspeld door sociodemografische kenmerken, klinische gegevens en pijn-gerelateerde factoren. Vergelijkbare resulaten worden gevonden in studies in populaties met andere chronische pijnklachten zoals rugpijn, whiplash syndroom en IBS (irritable bowel syndrome: spastische darm syndroom).
Ten derde tonen niet alleen onze studies aan dat er een relatie is tussen enerzijds chroni-

sche pijnklachten in de (onder)buik, en anderzijds hoge niveau's van angst en depressieve klachten en daarmee samenhangend een verminderde kwaliteit van leven. Deze relatie is ook gevonden in ander onderzoek onder vrouwen met CBP, en in populaties met andere chronische pijnklachten.
Tenslotte hebben wij ook een mogelijke samenhang gevonden tussen (een verandering in) catastroferen over pijn en de mate van ervaren pijn en aanpassing aan de pijn. Ook in experimentele en klinische studies in verschillende, andere patiëntenpopulaties met acute en chronische pijn, en in behandelstudies van patiënten met chronische rugpijn, chronische pijn en fibromyalgie is een dergelijke samenhang vastgesteld.

Er zijn kortom veel overeenkomsten tussen CBP en andere chronische pijnklachten, zowel in het beloop als in de factoren die het beloop beïnvloeden. De belangrijkste conclusie op basis van onze follow-up studies is dan ook dat CBP bij vrouwen beschouwd moet worden als een 'algemeen' chronisch pijn-probleem. Een dergelijke zienswijze heeft verstrekkende gevolgen voor de diagnostiek en behandeling van vrouwen met CBP in de klinische praktijk. Net als bij chronische pijn 'in het algemeen' moet men niet alleen aandacht hebben voor de somatische factoren die met CBP samenhangen, maar ook voor patiëntes aanpassing aan de pijn (angst en depressieve klachten en kwaliteit van leven) en voor psychologische factoren zoals haar opvattingen over pijn en pijn coping-strategiën.

Hoofdstuk 7: de anamnese bij vrouwen met CBP
In dit hoofdstuk hebben we een casus gepresenteerd aan de hand waarvan we stapsgewijs een gestructureerd model voor een anamnese illustreren, gebaseerd op cognitief gedragstherapeutische uitgangspunten. De gynaecoloog gaat hierbij in op de pijn, de pijngeschiedenis, de gedachten over de oorzaak van de pijn en de manier van omgaan met de pijn. Ook worden de cognitieve, emotionele, gedragsmatige, fysieke en sociale gevolgen van de klachten voor het dagelijks leven geïnventariseerd. Op deze manier wordt duidelijk in welke mate de vrouw gehinderd wordt door haar klachten. Deze gevolgen bieden een aanknopingspunt om de vrouw met CBP te motiveren voor 'pain management', gericht op het leren omgaan met de gevolgen van de pijn. Een dergelijke aanpak kán uiteindelijk leiden tot pijnvermindering.

De resultaten van de andere studies die in dit proefschrift zijn beschreven, hebben de volgende implicaties voor de klinische praktijk.
Bevindingen van real-time laparoscopie die zijn opgenomen op videoband, blijken geschikt om endometriose vast te stellen, tenzij sprake is van ovariële endometriose. In geval van adhesies is de beoordeling van bevindingen op een videoband evenwel onbetrouwbaar. Daarom dient een eventueel advies over chirurgisch ingrijpen bij adhesies op basis van een video-opname met enige terughoudendheid gegeven te worden, en zal zo mogelijk opnieuw een laparoscopie moeten worden verricht.
Wanneer het seksueel functioneren een onderwerp van gesprek is tijdens de anamnese met een vrouw met CBP, zal de gynaecoloog zich ervan bewust moeten zijn dat de rap-

portage van seksuele problemen meer samenhangt met angst en depressie dan met somatische variabelen zoals de ernst en fysieke hinder van de pijn. Immers, de vrouwen met CBP die meer seksuele problemen rapporteren, melden ook meer angst en depressieve klachten. Het is dan ook essentieel dat de gynaecoloog bij vrouwen met CBP niet alleen de somatische aspecten van de klachten belicht, maar ook nagaat in hoeverre sprake is van angst en depressieve symptomen. In de behandeling zal met deze pijn-gerelateerde klachten rekening gehouden moeten worden. Tot slot dient de gynaecoloog zich te realiseren dat seksueel geweld geen specifieke rol speelt bij het vóórkomen van seksuele problemen bij alleen vrouwen met CBP . Deze vorm van geweld speelt een belangrijke rol bij het ontstaan van seksueel disfunctioneren bij vrouwen met én zonder CBP .

Aanbevelingen voor onderzoek
Vervolgonderzoek is nodig om de verdere implicaties van de resulaten van onze studies te onderbouwen. Dergelijk onderzoek kan geënt zijn op datgene wat bekend is uit het veld van (acute en chronische) pijn in het algemeen.
Zo is het aan te bevelen toekomstig prospectief onderzoek op te zetten in (nieuwe) populaties van vrouwen met acute pijn in de onderbuik. Gegevens over het beloop van acute pijn in de onderbuik zoals na EUG (extra-uterine graviditeit ofwel buitenbaarmoederlijke zwangerschap) of bij (verdenking op een) torsie van een ovarium en over factoren die chroniciteit van de klachten voorspellen, kunnen helpen bij het identificeren van risicopatiënten. In dergelijk onderzoek kan ook de mogelijke rol van catastroferen op het beloop van acute en chronische pijnklachten nader worden belicht. Wanneer we meer weten over de voorspellers van chroniciteit of herstel, levert dat meer kennis op, en meer begrip voor vrouwen met buikpijn. Vervolgens zouden ook nieuwe (psychologische) behandelingen kunnen worden ontwikkeld om het risico te verminderen dat acute pijnklachten chronisch worden, of om het herstel na een chronische fase te bevorderen.

Uit de resulaten van onze studies is duidelijk geworden dat bij vrouwen met chronische pijn in de onderbuik niet alleen de somatische aspecten van de klacht belangrijk zijn, maar dat de ernst van de klachten ook een enorme impact heeft op de kwaliteit van leven. Bovendien hangt die ernst samen met bepaalde psychologische factoren. Met deze biopsychosociale kijk op pijn zullen behandelingen geïnitieerd kunnen worden die niet alleen gericht zijn op pijnvermindering, maar juist ook op verbetering van de kwaliteit van leven. Vervolgens dient de effectiviteit van dergelijke behandelingen onderwerp van vervolg onderzoek te zijn.

Tot slot, wanneer CBP beschouwd wordt als een algemeen chronisch pijn probleem, is het aan te bevelen de ontwikkelingen in de wereld van de chronische pijn te implementeren.

Women in
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Women in PAIN

Curriculum Vitae

De auteur van dit proefschrift is geboren op 27 januari 1953 te Deurne (Noord Brabant). Na het behalen van haar Gymnasium-β diploma aan het Collegium Marianum te Venlo in 1970, studeerde Philomeen Weijenborg drie jaar Scheikunde aan Universiteit Leiden. Na haar kandidaats diploma stapte zij over naar de studie Geneeskunde aan dezelfde universiteit. Eind 1980 behaalde zij haar artsexamen. Hierna werkte zij één jaar als arts bij de NVSH Abortuskliniek in Scheveningen. Haar opleiding tot gynaecoloog doorliep zij van 1982 tot 1987 (universitair deel: Leids Universitair Medisch Centrum, Leiden, opleider prof Dr E.V. van Hall, niet- universitair deel: St Lucas Ziekenhuis, Amsterdam, opleider Dr W.J. Honnebier). Na een korte periode als gynaecoloog werkzaam te zijn geweest in het Medisch Centrum Rijnmond-Zuid te Rotterdam, werd zij in 1988 eerst junior staflid en drie jaar later, lid van de maatschap Gynaecologie bij de afdeling Gynaecologie van het Leids Universitair Medisch Centrum. Zij was mede initiatiefnemer van de polikliniek Psychosomatische Gynaecologie en Seksuologie van het LUMC, waarvan zij sinds de oprichting in 1991 het hoofd is. Zij is hoofd van de sectie Gynaecologie en Psychosomatische Gynaecologie en Seksuologie.

Sinds 1998 is de auteur van dit proefschrift actief betrokken geweest bij de opzet en uitvoer van de verschillende studies, welke in dit proefschrift beschreven zijn. Dit hele traject is een logisch gevolg van haar motivatie om als gynaecoloog de zorg aan de vrouwelijke patiënte (met buikpijn) te optimaliseren.

Daarnaast was zij van 1985 tot 1992 voorzitter van de Stichting Samenwerkingsverband tegen Seksueel Geweld te Leiden e.o., waarin zedenpolitie, maatschappelijk werk, FIOM, GGZ en artsen gezamenlijk het probleem van seksueel geweld onder de aandacht brachten en de hulpverlening op elkaar afstemden. Tot 1998 was zij vervolgens lid van de stuurgroep Coördinatiepunt tegen Seksueel Geweld te Leiden.

Tijdens haar opleiding tot gynaecoloog heeft zij haar eerste (observationele) onderzoek opgezet en uitgevoerd onder vrouwen die geboren zijn met het syndroom van Mayer-Rokitansky-Küster (MRK syndroom). Zij belichtte daarin de psychologische en sociale gevolgen van het leven zonder baarmoeder en vagina voor deze vrouwen. Ook startte zij in 1991 lotgenotencontact, wat vervolgens resulteerde in de oprichting van de Stichting MRK-vrouwen.

Van 1992 tot 1999 was Philomeen Weijenborg secretaris van de werkgroep Psychosomatische Obstetrie en Gynaecologie (WPOG) van de Nederlandse Vereniging voor Obstetrie en Gynaecologie (NVOG). Zij initieerde het Landelijk Overleg Poliklinieken Seksuologie (LOPS) in 1995, waarin de academische en later ook de niet-universitaire poliklinieken seksuologie zich verenigden om patiëntenzorg, onderwijs en onderzoek op elkaar af te stemmen en te optimaliseren. Van 1995 tot 2002 was zij secretaris van het LOPS. Sinds 2002 is zij redacteur van het boek Seksuologie, een Nederlandstalig handboek voor artsen en psychologen. Ook is zij sinds 2003 bestuurslid van de Werkgroep Voor Seksuele Dis-

functies (WVSD), de Nederlandse tak van de European en International Society of Sexual Medicine (ESSM en ISSM).

Namens de Nederlandse Vereniging voor Obstetrie en Gynaecologie (NVOG) leverde ze een bijdrage aan het tot stand komen van het multidisciplinaire Standpunt 'Grenzen aan esthetische genitale chirurgie' en het 'Modelprotocol labiumreductie' De laatste twee jaar is zij namens de NVOG lid van de richtlijncommissie van het Trimbos Instituut betreffende de multidisciplinaire richtlijn "Somatisch Onvoldoende verklaarde Lichameljke Klachten en Somatoforme Stoornissen".

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Ook van essentieel belang is de samenwerking met de psychologen van het Psychologisch Instituut in Leiden (Anja, Liesbeth en Philip) in de afgelopen jaren geweest. Met hun inzet en steun zijn de onderzoeken, zoals beschreven in dit proefschrift, van de grond gekomen en heeft het multidisciplinaire karakter duidelijk vorm en inhoud gekregen. We kunnen gezamenlijk trots zijn op het resultaat van deze vruchtbare, leuke en intensieve samenwerking!

Ook de afdeling Maag-, Darm- en Leverziekten (MDLZ) van het LUMC (Ad, Annemieke en Patrick) heeft een belangrijke rol gespeeld. Zowel op de afdeling Gynaecologie als bij MDLZ werden in nagenoeg dezelfde periode patiëntendata verzameld, welke zonder enige terughoudendheid aan elkaar werden uitgewisseld om zo "de aantallen te vergroten" en de vraag te kunnen beantwoorden of "internistische buikpijn" verschilt van "gynaecologische buikpijn". De toekomst zal dat uitwijzen....!

Daarnaast ben ik dank verschuldigd aan mijn collega gynaecologen binnen het LUMC en ook daarbuiten, die mij ieder op hun eigen wijze hebben gestimuleerd het onderwerp "chronisch buikpijn" (verder) uit te diepen en de bevindingen op te schrijven.

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