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

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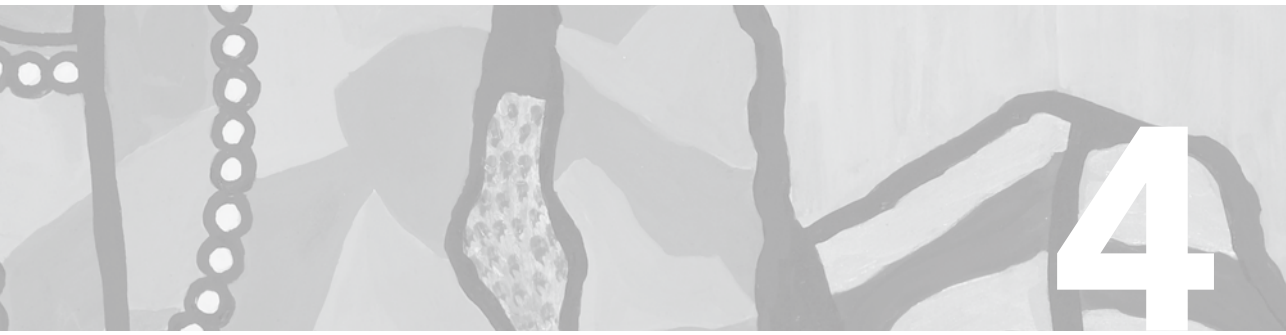
Women in
PAIN

Adapted from Eur J Pain 2009 May 5
[Epub ahead of print]

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



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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.

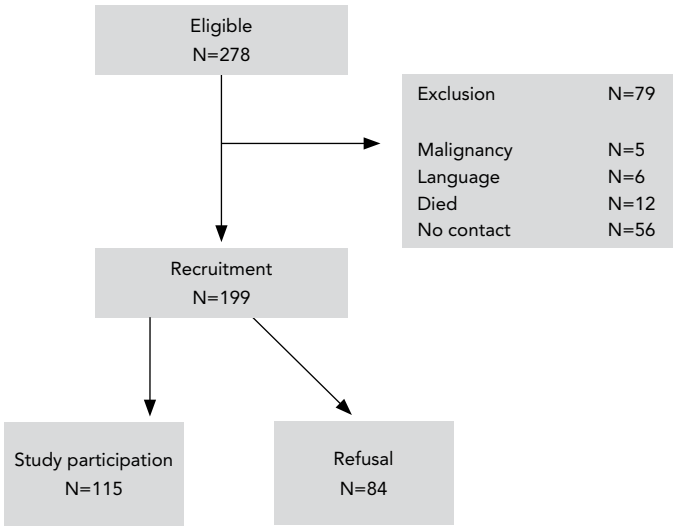
First, a description of the subjects of the study sample was given and a comparison of the results with those who did not consent participation was made by using Chi-squared (χ^2) and Student's *t*-test for independent samples in case of respectively dichotomous and continuous variables. Second, we used 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].