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Improving care for acutely presenting older patients visiting the emergency department: the implementation of geriatric screening in routine care

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Chapter 1

General Introduction

Background

Worldwide, Emergency Departments (EDs) provide immediate care of acutely ill or injured patients, and are characterized by a high patient turnover, rapid triage, acute intervention and fast disposition^{1,2}. In the past decades, the growing number of older people presenting to EDs is slowly transforming the practice of emergency medicine³, and the new field of geriatric emergency medicine addresses the challenges of providing acute care for older ED patients. Compared to younger patients, older patients use emergency services more often, have longer stays in the ED and are more likely to be admitted or to have repeat ED visits⁴⁻⁶. Additionally, delivering good emergency care to older people is challenging because older patients more often have non-specific disease presentations, have higher rates of serious illnesses and tend to have more comorbidities, polypharmacy and cognitive disorders compared to younger patients^{7,8}. All these factors taken together complicate the ED presentation, diagnosis and management of older patients. Furthermore, older ED patients are at high risk of adverse health outcomes, such as mortality or functional decline. The risks are particularly high in the first three months after an ED visit, with a mortality rate around 10% and increased functional dependence between 10-45%⁴. However, not all older people presenting to the ED are at high risk of adverse outcomes, because they represent a very heterogeneous group: some are vital, others have considerable frailty⁹. The early identification of different risks followed by personalized treatment could lead to an improvement in ED care for older patients.

Comprehensive Geriatric Assessment (CGA) is an effective method to identify older patients at increased risk of adverse health outcomes and consequently improve patient outcomes¹⁰. However, performing a complete CGA of all older patients in the ED setting is often impossible due to time constraints, the lack of specific training to undertake CGA and often the condition of the patient¹¹⁻¹³. Alternatively, a two-step approach can be used with an early identification of patients at highest risk as a first step, followed by targeted interventions according to the principles of CGA¹⁴. This two-step approach is increasingly used in various health care settings, for example by general practitioners for case-finding in primary care and in oncologic care in hospitals^{15,16}. In the ED setting, several risk stratification tools and screening instruments have been specifically developed for older ED patients¹⁷. Some of these tools use geriatric parameters to measure frailty, while others predict the risk of various short-term adverse health outcomes¹⁸⁻²⁰. Even though these tools therefore measure different things, the terms for tools are used interchangeably in literature. In this thesis, the term 'geriatric screening' is used. The comparison of tools is challenging due to the use of different endpoints, and the development and validation in different health care settings and countries. Therefore, there is no consensus on which tool regarding predictive value and feasibility is best to use in clinical ED practice. More importantly, the clinical value of using geriatric screening in the ED is still unclear²¹. Limited research has been conducted on the extent to which geriatric screening parameters, combined with other

characteristics measured in the ED, contribute to the risk of adverse outcomes in older patients. In the ED, risk stratification is executed by means of triage tools, which are based on the patients' clinical urgency only. It might be of added value to take frailty into account by combining a geriatric screening tool and an urgency triage tool in older ED patients. Furthermore, approximately 20-25% of older patients visit the ED due to a fall and since falls may indicate underlying frailty, the association between geriatric screening and fall characteristics with adverse health outcomes needs to be further explored. Finally, it is unknown whether geriatric screening parameters measured in the ED are associated with long-term adverse health outcomes, although this could aid in individualized treatment decisions to optimize outcomes for older patients.

The following challenge for the field of geriatric emergency medicine is the implementation of screening in routine ED practice. Although many geriatric screening instruments have been reported in literature, and the use of these instruments is promoted in international guidelines, widespread dissemination remains scarce²². One of the important reasons why screening of older ED patients is rarely carried out in routine care, is the fact that little is known about the practical issues and feasibility of implementation in the fast-paced environment of everyday ED practice²³. Understanding how tools are likely to be used in routine clinical practice is important to ensure that they are accepted by ED care providers and older patients, which increases the chance of successful implementation²⁴. Tools can have the best validated predictive values, but there will be no benefit for patients if they are not used due to unsuccessful implementation in practice²⁵. The gap between research and practice needs to be bridged by focusing more on implementation outcomes, such as the feasibility of screening, the effects of implementation on process of care, the acceptability among care providers and the experiences of older patients²⁶.

One of many developed screening instruments for the ED is the Acutely Presenting Older Patient (APOP) screener²⁷. The APOP screener identifies the individual risk of 90-day functional decline and/or mortality and signs of impaired cognition for ED patients aged 70 years and older. The instrument was developed in the Netherlands and cross-validated in four Dutch hospitals²⁸. In order to increase the chance for successful implementation, the screener was refined according to international methodological standards. The final screener consists of nine questions and can be administered within two minutes. In this thesis, the APOP screener was used as an instrument for geriatric screening to answer our research questions.

Aim of the thesis

To improve care for acutely presenting older patients visiting the ED, this thesis has two aims. The first aim of this thesis is to study the association of geriatric screening parameters collected in the ED with various adverse health outcomes in different subgroups of older ED patients. The second aim of this thesis is to investigate the

feasibility, impact and experiences of implementing a geriatric screening program in routine ED practice.

Outline of the thesis

This thesis is divided in two parts. The first part of this thesis describes the motivation regarding the strategy of using geriatric screening in ED care. In **chapter 2** we study the effect of geriatric screening parameters on the association of triage urgency levels and adverse health outcomes in a broad population of older ED patients. **Chapter 3** studies the relationship between geriatric screening and fall characteristics with three months and one year functional decline and mortality in older patients who presented themselves to the ED with a fall. In **chapter 4** we describe a population of acutely hospitalized older internal medicine patients and the association between geriatric parameters, measured with screening in the ED, and clinical outcomes and long-term adverse health outcomes.

The second part of this thesis consists of studies about the implementation of geriatric screening in routine ED care. **Chapter 5** studies the feasibility and acceptability of the use of geriatric screening in the ED, by evaluating these outcomes after implementation of the APOP screener in routine ED care in the Leiden University Medical Center. In **chapter 6**, the effects of the implementation of the APOP screening program are evaluated in a before-after design, by assessing the compliance with program interventions and the impact on process of care measures. In **chapter 7** we explore the experiences with and attitudes towards geriatric screening in routine ED care among older ED patients using qualitative research methods.

Finally, in **chapter 8** the main conclusions of this thesis are summarized and discussed, and future perspectives are proposed.

Overview of used patient cohorts

APOP prospective cohort

The APOP prospective cohort is collected within an observational multicenter study that was performed in four Dutch hospitals: the Leiden University Medical Center (LUMC), Alrijne Hospital location Leiderdorp, Haaglanden Medical Center (location Bronovo) and Erasmus University Medical Center. Patients were included between September 2014 and January 2017. All consecutive patients visiting the ED, aged 70 years or older, were included. After routine urgency triage, data were collected by trained medical students on demographics, severity of disease indicators and geriatric measurements (i.e. Katz activities of daily living questionnaire and six-item Cognitive Impairment Test). The endpoints of this study were three months and one year functional decline and mortality.

APOP implementation cohort

The APOP implementation study was executed in the ED of the LUMC and used a before-after design. The APOP screening program was incorporated after routine urgency triage from March 2018. All consecutive patients aged 70 years or older who visited the ED in the two months before implementation (December 2017 – February 2018) and two months after implementation (April 2018 – June 2018) were included. In both data collection periods, we collected patient characteristics, organization-related characteristics (i.e. the number of available personnel and measurements of crowding), the execution of program interventions and process of ED care measures (i.e. ED length of stay). Patient characteristics and process of care measures were collected from medical records. Organization-related measurements and the execution of interventions were collected with real-time observations by trained medical students. In the two months period after implementation, additional data was collected on the screening rate. The endpoints of this study were two-fold. First, the feasibility of screening, evaluated by measuring the screening rate and patient- and organization-related determinants of screening completion after implementation. Second, the effects of implementation, evaluated by the compliance with interventions and the impact on process of care after implementation compared to before implementation.

APOP qualitative interview cohort

The APOP qualitative interview cohort is the result of an explorative qualitative study conducted between September 2019 and January 2020. The target population was comprised of older patients aged 70 years and older who recently visited the ED of the LUMC and had completed the APOP screening tool during their stay in the ED. Fourteen individual face-to-face semi-structured interviews were conducted to gain insight in the experiences with, and attitudes towards screening in routine ED care among older people.

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