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Cognitive impairment in older emergency department patients

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Chapter 9

General discussion

GENERAL DISCUSSION

Key findings

This thesis has four key findings. First, cognitive impairment is associated with adverse outcomes in older ED patients as well as acutely hospitalised older patients. The 6-CIT seems to be a reliable tool to use in ED settings with good correlation with adverse outcomes, in contrast to the CAM-ICU. Second, it is possible to predict adverse outcomes such as hospital admission and mortality in older ED patients using routinely collected clinical data. Third, when adding cognitive impairment and several parameters that can be assessed by the triage nurse to routinely collected parameters, functional decline and mortality of older ED patients can be successfully predicted. Finally, vital signs representing decreased brain perfusion and oxygenation are associated with cognitive impairment.

Identification of cognitive impairment

Cognitive impairment is an under diagnosed disorder in the ED and in this thesis we show it is associated with adverse outcomes in older people. We found that almost one third of older patients in Dutch EDs suffer from cognitive impairment, which means that these patients might be unable to provide accurate information about their medical history and medicine use and puts the patients at risk of not understanding or remembering treatment plans and discharge instructions completely[1]. Delirium and dementia are the most common causes of cognitive impairment in older ED patients. Higher age and dementia are the most important risk factors for developing delirium which adds to the difficulty of making the correct diagnosis of delirium in the ED. Patients with cognitive impairment in the ED have more risk of experiencing adverse events, such as mortality, falls and further cognitive decline, especially in those with pre-existing cognitive impairment. This shows the importance of testing for impaired cognition at an early stage during the ED visit of all older patients[2] to make sure that caregivers recognize cognitive impairment. For this reason, it is for the utmost importance to implement a 'mental status assessment' as vital sign into daily practice at the ED[3].

Reversibility of cognitive impairment by optimal treatment of brain hypoperfusion

A next step would be to assess in the acute setting whether there is a group of patients in which the cognitive impairment is caused by decreased brain oxygenation and perfusion which might be reversible. This follows the general principle of Emergency Medicine in which acute problems are treated first. While the pathophysiology of delirium is still under investigation, there are two proposed pathways. The first is through direct brain insults, such as hypoxia, metabolic abnormalities, stroke and drug effects which

can cause delirium. A second pathway is that of the 'aberrant stress response' in which pro-inflammatory cytokines, elevated cortisol and the GABA system seem to play a role in the disease process secondary to a somatic illness[3-5]. Cognitive impairment caused by either hypoxia and brain hypoperfusion or through delirium (direct brain insult pathway) might be reversible with optimal resuscitation. In chronic conditions such as heart failure and carotid occlusive disease, patients with impaired cerebral blood flow and cognitive function improved when cardiac output improved or when the carotid occlusion was bypassed[6-8]. Similar mechanisms might be at play in the acute setting. When 'cognitive impairment' would be recognized as a vital sign in older patients as a marker of possible severe illness this might help to identify patients in need of aggressive resuscitation[9]. However, there are also specific patient groups, such as patients with severe dementia, in which aggressive treatment is no longer desirable. Future research could include performing gold standard assessments to measure type of cognitive impairment, such as delirium, dementia or other causes, and measuring brain perfusion, at moment of arrival to the ED. Several instruments have been tested to measure brain perfusion and brain activity, such as a transcranial Doppler[10] and EEG measurements[11]. Then, if patients receive adequate resuscitation, follow up measurements of brain perfusion and cognition should clarify whether cognitive impairment due to hypoperfusion of the brain is reversible in the acute setting, as it has been proven in the chronic setting[6]. Finally, it should also be investigated whether improving cognition in the ED due to optimal resuscitation also improves clinically relevant outcomes in short and long term for these patients.

Distinction between various causes of cognitive impairment in the ED setting

Whether it is important to distinguish delirium from dementia in the acute setting is subject to discussion[12, 13]. As mentioned earlier, delirium and dementia are the most common causes of cognitive impairment, both associated with adverse outcome and it is known that the two are strongly linked[4, 12]. A recent study showed little variation in adverse outcomes of patients with different types of cognitive impairment[13]. In our studies we also did not find great variability in the outcomes of older patients with different types of cognitive impairment when performing sensitivity analysis. Furthermore, tools having the ability to distinguish between delirium and dementia by non-specialist care providers, with high acuity, are not readily available[14], and this distinction can be very difficult to make, even for experienced clinicians[4]. It could be argued that a simple test to measure cognitive impairment by all staff working in the ED is more feasible to implement. Finally, in the acute setting making this differentiation has little consequence because the difference between the non-pharmacological treatment of delirium and prevention of delirium in high-risk cases (i.e. dementia) is not always clear, has not

been investigated and comes down to similar principles. The only difference is that in case of delirium the underlying cause should be found. However, in the ED, somatic illness which can be the precipitating factor for delirium such as a possible infection or hypoxemia are looked for in all patients using the ABCDE approach. This makes it unlikely that possible somatic illness causing delirium is overlooked. Therefore, we propose to start non-pharmacological measures in all patients with cognitive impairment in the ED, as they either have delirium or are at high risk of developing delirium. Non-pharmacologic measures to prevent and treat delirium have been proven to be cost-effective in hospitalised older patients[15]. Once patients are out of the acute setting, the cause of the cognitive impairment can be investigated by an experienced specialist trained in mental status assessment, cognitive testing and obtaining information from informants. Pharmacological interventions such as treatment with antipsychotic drugs, such as haloperidol should be reserved only for patients in whom delirium is diagnosed, and only if there is a clinical indication such as failure of non-pharmacological treatment or because of the risk of inflicting damage upon oneself as a result of agitation. With previous healthcare initiatives it was shown that with a widespread campaign with clear treatment goals it is possible to change the recognition of a disease and its treatment[16, 17]. We propose that a similar program or intervention might also be necessary for the recognition and treatment of cognitive impairment in older patients in the ED.

Screening instruments – different care systems, different solutions?

Several screening instruments for adverse outcomes after a visit to the ED have been described in literature in the last decades, however, these lack accuracy when validated in other study populations[18]. It has been shown that prediction models can behave differently in different patient populations and that implementation of intervention programs is not always successful or reproducible in other settings[19]. One of the reasons for the lack of a global wide implemented screening instrument for older ED patients are differences between care systems, or sometimes even differences within countries; for example, not all Dutch EDs are staffed with ED-physicians. Furthermore, nomenclature such as 'frailty', 'crowding', 'acute wards' and 'Emergency Departments' could be defined entirely different[20, 23], and mean length of stay can vary greatly between countries[21, 22]. EDs can be staffed with different teams of varying expertise, which can have influence on patient satisfaction and patient flow[23]. Some tools that might not work in the Netherlands, for example the CAM-ICU as we showed **chapter 7**, might work in systems where patients stay in the ED for longer amounts of time. In **chapter 6** we describe the successful derivation and external validation of the APOP-screener in the Netherlands. The APOP-screener can be used to predict functional decline and mortality, as well as screen for cognitive impairment, in older patients at the moment of arrival to the ED.

Above mentioned arguments however could also mean the APOP-screener and intervention package cannot be copied one on one to other countries.

Several taskforces for European and worldwide collaboration on GEM have been established in the last years. The focus of these groups should be to find similarities in problems of older patients in the ED between care systems. They should facilitate the development of universal toolboxes which contain screeners for risk stratification, cognitive impairment, and proposed interventions that can be amended to the local situation, from which individual care systems and patients can profit. These toolboxes should be adequately distributed, after which it should be assessed whether this also improves clinically relevant outcomes for older patients and is cost-effective. This could be done by performing impact studies using tools such as the RE-AIM framework to assess which screeners and interventions work for different care systems.

Future perspectives

In the APOP-study we have performed several pilots with nurses working in the ED to see if the APOP-screener was feasible, as described in **chapter 6**. After feedback of the nurses changes were made to the lay-out and items in the screener. Currently we are implementing the APOP-screener in one hospital to screen for cognitive impairment and risk of adverse outcomes on a wide scale and will evaluate its feasibility and impact using the RE-AIM framework[24]. If it is possible to use the APOP-screener in clinical practice for a longer period of time, the final step would be to assess whether it also improves outcomes for older patients in larger multicentre studies. If successful, wide dissemination and implementation of the APOP-screener in the Netherlands would be next.

This thesis describes one of the first multidisciplinary initiatives in the Netherlands in which Internal Medicine, Geriatric Medicine and Emergency Medicine work together in the field of Geriatric Emergency Medicine (GEM). To improve and propagate GEM throughout training programs of several medical specialties and EDs in the Netherlands is one of the future goals.

Clinical implications

This thesis brings forward several important findings for clinical practice. First of all, we propose a workflow which provides optimal care for older patients with cognitive impairment as can be seen in figure 1. In this workflow we show how the APOP-screener (**chapter 6**) can be used in clinical practice to detect patients with cognitive impairment and how caregivers in the ED can act accordingly. Secondly, this thesis provides a basis for further development and implementation of frailty screeners for older ED patients. The APOP-screener can also be used to assess which patients have cognitive impairment and who have the highest risk of adverse outcomes and could make it possible to ad-

equately distribute resources in a system which is already working at its threshold, as has been deemed a priority in recent literature[25]. Alternative interventions and workflows can be invented and implemented to prevent delirium and adverse outcomes in older ED patients at risk using the APOP-screener. Furthermore, as described in **chapter 7**, we warrant caution to use the CAM-ICU as screener for delirium in care systems where older people have a relatively short ED length of stay.

Flowchart: Cognitive impairment in older ED patients

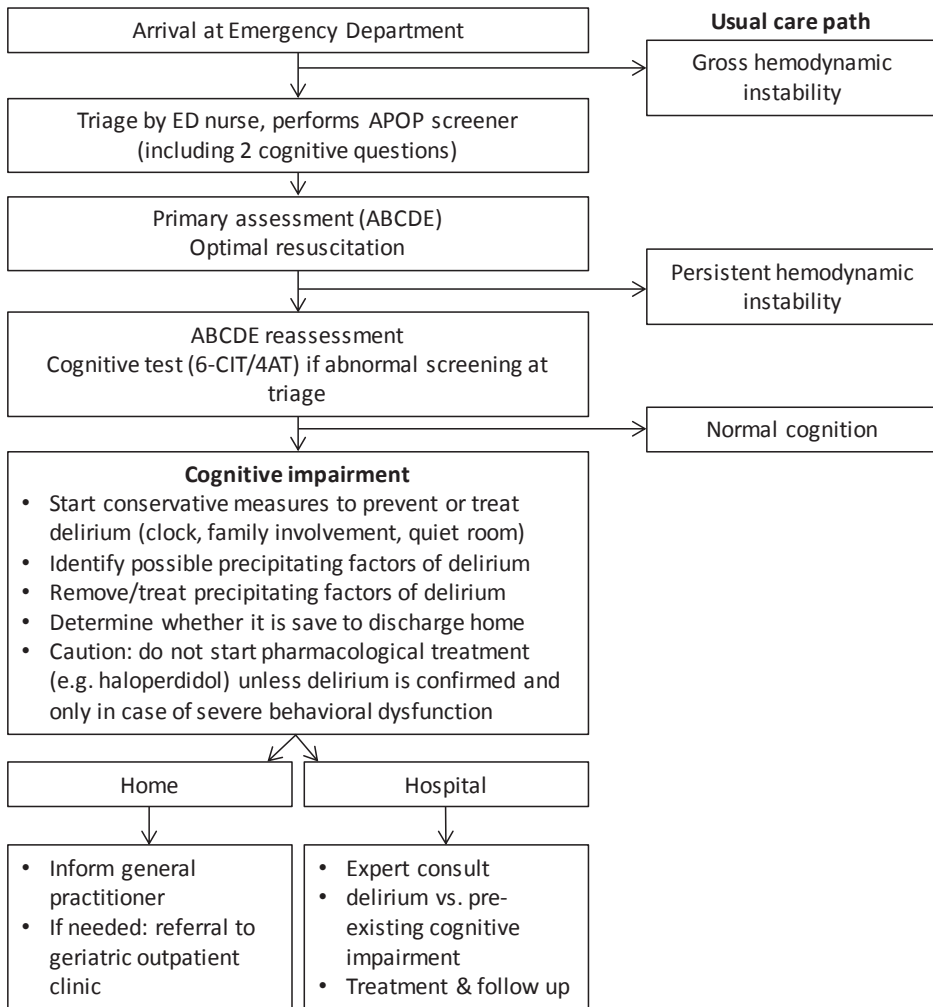


Figure 1. Flowchart: Cognitive impairment in older ED patients

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