The effect of specialist treatment in Emergency Medicine. A survey of current experiences

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ABSTRACT:

BACKGROUND: It is under consideration if a new medical speciality in Emergency Medicine should be established in the Nordic countries. But does the introduction of Emergency Medicine as a speciality improve care?

METHOD: A structured PubMed-search revealed 25 studies considering the effects of introducing a speciality in Emergency Medicine or comparing emergency treatment by specialists in Emergency Medicine with treatment by other doctors.

RESULTS: Having specialists in Emergency Medicine improved the care for patients who needed urgent lifesaving interventions (e.g. patients with myocardial infarction, trauma patients) and made the admission processes more efficient. Specialists in Emergency Medicine also safely performed procedures that have traditionally been considered exclusive parts of other specialities, e.g. intubation.

CONCLUSION: The introduction of a speciality in Emergency Medicine appear to improve the standard of care for acutely ill patients.

KEYWORDS: Emergency medicine, speciality, effect, outcome, impact

Introduction

Although Emergency Medicine (EM) has been recognised as a speciality in English speaking countries for more than 20 years, Iceland is the only Nordic country where EM is fully recognised as a speciality. In other Nordic countries the treatment of acutely ill patients is currently a topic of debate (1,2). There is increasing concern that the present system where junior doctors staff the Emergency Department (ED) may not provide an adequate standard of care. It has been argued that the establishment of a speciality in Emergency Medicine might improve the quality of treatment (1). So far there have been no comprehensive reviews of the consequences of establishing a speciality in Emergency Medicine. Therefore the present paper provides a review of the current literature.

Material

A PubMed-search was undertaken in October 2005. The search term "Emergency Medicine" was combined with one of the following search terms: "Outcome" (603 titles retrieved), "efficiency" (79 titles), "effect" (207 titles), "Impact" (241 titles). No other restrictions to the search were made. All retrieved titles were reviewed.

Papers where included in this review if:

- Quality of care was compared with and without specialists/ residents in emergency medicine on call

OR

- Patients where randomised to be seen either by a specialist/ resident in emergency medicine or a specialist/resident in another medical speciality

OR

- Patients or test results where seen by both a specialist/ resident in emergency medicine and a specialist/resident from another relevant speciality.

OR

- Competency between different levels of training in emergency medicine was evaluated.

Studies fulfilling the criteria above were included in this review and additional studies were identified from the reference lists of the relevant papers.

Results

Admission rates, duration of hospital stay and accuracy of diagnosis and documentation have been studied as overall indicators of hospital performance (3-9).

Treatment by specialists in emergency medicine increased treatment time in the ED (3) but did not affect admission rates (4, 5). The establishment of observation wards within the emergency department decreased the overall length of hospital stay (6, 7). In addition patients who were admitted to specialized departments were so quicker when emergency physicians have the full responsibility for patient care, including the right to admit patients without consulting a doctor from the receiving speciality (8).

Concordance between admission diagnosis made by emergency physicians and the final hospital discharge diagnosis was high (99% in ref. 8) and the introduction of an emergency medicine

residency program did not increase the number (and costs) of diagnostic laboratory tests (9).

McNamara & Kelly performed a retrospective chart review of patients who presented to the ED with one of five complaints (chest pain in adults, lower abdominal pain in women of child-bearing age, head trauma, headache, and extremity lacerations)(10). They concluded that the introduction of an emergency medicine residency significantly improved the level of documentation.

Cardiac diseases

The treatment of patients with cardiac diseases is appropriate as a measure of the quality of care in the ED: patients with cardiac disease are common in the ED, they benefit from urgent treatment and treatment can be evaluated using well defined endpoints such as time to revascularisation. Management of cardiac diseases by emergency physicians has been studied by several groups (7, 11-16).

Time to primary revascularization of patients with acute myocardial infarction decreased significantly after the introduction of emergency physicians to an ED in two studies (7, 11). In a study by Weaver (11) the median time was 44 min before EM faculty presence compared to 24 min after. With EM faculty presence 65% of patients received thrombolysis or angioplasty within 30 minutes of arrival at the ED (compared to 25 % of patients before); an additional effect was an overall reduction in the duration of hospital stay (11).

Emergency medicine residents did better than internal medicine residents when asked to interpret electrocardiograms (ECG) and state the correct management of the arrhythmias of acutely ill patients (12). In another study the ECG interpretation skills of emergency physicians equalled those of cardiologists (13).

After brief training emergency physicians could insert transvenous pacemakers with the same success and complication rate as cardiologists (14), and could successfully assess left ventricular function with echocardiography (15).

Survival of in-hospital cardiac or respiratory arrest was not associated with the speciality of the physician on the cardiac arrest team (emergency physicians compared to staff physicians) (16).

Trauma

The outcome of trauma patients have been compared between level 1 trauma centres with and without emergency medicine residency programs in a study based on the American College of Surgeons National Trauma Database (17). Trauma Revised Injury Severity Scores (TRISS) was the same for the two groups of patients, but hospitals with emergency physicians treated an older patient population, who had more burns and penetrating traumas and who were longer in the ICU. Since these factors are usually negative predictors of survival, it was expected that the group treated in hospitals with emergency medicine residents would have the worse outcome. On the contrary: Hospitals with emergency medicine residency program turned out to have significantly lower rates of mortality and complications and the patients had shorter hospital stays.

Two other studies support the association between specialised care for emergency patients and improved outcome for trauma patients. A Scottish study showed that the survival of trauma patients was associated with the trauma leaders experience in emergency medicine (18), despite that the most experienced doctors also treated the most severely injured patients. On a population level it seems that increasing numbers of Advanced Trauma Life Support (ATLS)-certified surgeons and emergency physicians in a county decreased trauma related mortality (19).

Minor injuries

Surprisingly only one study could be identified that concerned minor illnesses:
Specialists in emergency medicine were only marginally better that younger colleagues and general practitioners in treating minor hand injuries (20).

Airway management

Airway management is a basic of skill of specialists in emergency medicine who routinely treat patients in the ED before transferring them to the intensive care unit. Still it has been debated which patients should be managed by anaesthesiologists instead of emergency physicians. As a result several studies have focused on airway management by emergency physicians.

Emergency physicians performed oral intubations of adult trauma patients with the same success and failure rate as anaesthesiologist, provided that there were no signs of a difficult airway prior to intubation (21, 22); Both studies used historical controls thus limiting the interpretation.

The results however were confirmed in a prospective study where trauma airway management alternated between emergency medicine residents and anaesthesia residents during the week. There were similar results in the two groups, with a low incidence of repeated laryngoscopy (3 attempts=2.9%) and a low incidence of cricothyrotomy (0.3%) (23). The emergency physicians ended up intubating twice as many patients as the anaesthesiologist because, because they were immediately available to intubate patients with penetrating trauma who could not wait for an anaesthesiologist to arrive.

Chang et al. (24) found that the rate of cricothyrotomy in trauma patients decreased concomitantly with the introduction of residents in emergency medicine at an ED. Although much cited as evidence of the skilfulness of emergency physicians this study probably merely reflects an overall decline in the frequency of cricothyrotomy.

Radiology

Alfaro et al. determined the concordance of emergency physicians and radiologists in interpreting cranial computed tomography (CT) scans (25). Of 554 patients undergoing CT scanning during emergency department evaluation (25) nonconcordance between radiologists and emergency physicians was found in 38.7% of cases. Potentially clinically significant misinterpretations were found in 24.1% (n=131) of the total sample (including missed major findings: 25 new infarcts, 10 mass lesions, 8 cases of cerebral oedema, 8 parenchymal haemorrhages, 5 contusions, 4 subarachnoid haemorrhages, 1 epidural haematoma, and 1 subdural haematoma).

One study (26) has focused on emergency physicians' ability to interpret emergency radiographs: Sensitivity, specificity and accuracy were significantly lower for specialists in emergency medicine compared to radiology residents and specialists in interpretation of emergency department radiographs (26). The study, however, was small with only 16 volunteers (8 emergency physicians and 8 radiologist of varied experience).

The fact that radiologists did better than non-radiologists in interpreting CT-scans and plain x-rays is hardly surprising. The finding probably underscore the value of specialist training. In fact, the number of missed fractures decreased considerably when specialists in Emergency Medicine took over the responsibility for an emergency department (7).

Malpractice

Physicians with residency training in emergency medicine accounted for less malpractice indemnity than physicians who worked in an ED without having formal training in emergency medicine. This difference was a result of fewer closed claims with indemnity paid out (27). In addition the complaint rate fell after specialists in Emergency Medicine took over the responsibilty for treatment in an emergency department at an Australian hospital (7).

Malpractice cases that result in indemnity payments, however, is not a reliable measure of sub-standard medical care (27). In addition the study used data from an insurance company in Colorado, USA, where the tendency for patients to file lawsuits is probably high.

Teachning and Research

Teaching, research and publishing in the field of emergency medicine increased when specialists in emergency medicine took over the management of an Australian ED (7).

Conclusion

The research evaluating the effect of specialist training in EM has concentrated patients with a need of urgent lifesaving interventions (e.g. patients with trauma or cardiac disease). Surprisingly the review of the literature found only a few studies focusing on the minor injuries that are abundant in the ED.

Having specialists in EM improved care for patients who need urgent treatment including patients with myocardial infarction, trauma patients and in general patients needing admission. Specialists in EM can safely perform procedures that in Scandinavia are traditionally considered exclusive parts of other specialities (e.g. intubation or transvenous pacemaker placement).

Thus concerns that the introduction of Emergency Medicine as a speciality will lower standard of care (2) are unwarranted and not supported by the current literature. On the contrary: The establishment of a speciality in Emergency Medicine would most likely improve the standard of care for acutely ill patients.

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