



Original Article

When should a doctor see me when I get sick? A study of the time of day acutely ill medical patients present and the time they wait to see a doctor in Ireland

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ABSTRACT

Background: Reconfiguration of the Irish Health Service has diverted of large numbers of acutely ill medical patients to a reduced number of hospitals and may have caused in delays in treatment. Although prompt care improves outcomes for patients with acute myocardial infarction, stroke, infection and shock, there is surprisingly little evidence for its value in other conditions.

Methods: The time of admission and time patients waited to be seen and clerked by a doctor was reviewed on all medical patients admitted to Nenagh Hospital prior to service reconfiguration (i.e. from 17 February 2000 to 6 March 2004).

Results: Over the study period of 1442, days 9435 patients were admitted (i.e. 6.5 patients per day or 0.3 per hour) and waited 37.6 SD 53.1 min after admission before they were seen by a doctor. The peak time of admission is in the late afternoon and early evening and there was a liner correlation between the delay before seeing a doctor and the time of admission. The 1095 patients who waited 80 min or more to be seen and clerked by a doctor (median delay 120 min) were more likely to die (odds ratio 1.36 95% CI 1.03–1.81, $p < 0.03$).

Conclusion: Waiting to be seen by a doctor may increase the risk of death to some patients. For these patients it is probably safer to be seen quickly by any doctor, rather than travel many miles and wait several hours to see a better one.

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1. Introduction

Over the last 10 years Ireland has belatedly followed the example of the United Kingdom by concentrating acute hospital medical care into a small number of acute medical units (AMUs) in regional “centres of excellence”. Prior to this reconfiguration much acute medical care was provided by small rural hospitals. Although evidence for the efficacy of acute medical units remains limited [1], it was assumed that they would provide quicker access to better care and, therefore, better outcomes [2]. However, the diversion of large numbers of patients to only a few centres has resulted in considerable delays in treatment, which anecdotally have been reported to be of several hours and prompted considerable public concern and media attention [3,4]. Whilst this “access block” to treatment is a new phenomenon in Ireland, it is widespread in other healthcare systems [5,6]. Media reports from the United Kingdom claim waiting times of over 8 h [4], and in a recent audit the mean time for being clerked by a junior doctor in-training ranged from 3 h 13 min to 12 h 30 min (mean delay 6 h 55 min) [7].

These current concerns about the delayed treatment of acutely ill medical patients prompted us to review our data on the time of patient admission and the time each patient waited before being seen and clerked by a doctor collected in our hospital prior to the start of the

reconfiguration process. These findings have been stratified according to each patient's severity of illness as measured by the Simple Clinical Score (SCS), a reliable instrument that objectively assesses and measures severity of illness that has been independently validated elsewhere in several different clinical settings [8–11].

2. Method

This study was performed at Nenagh Hospital from 17 February 2000 to 6 March 2004.

A full-time data collection officer (BD), after discussion with the nursing staff and usually within 24 h of admission, entered the time admission and time patient was first seen and clerked by a doctor, along with other clinical data into an Epi-Info version 6.0 database. Patients were stratified according their risk of 30 day mortality determined by their SCS that places patients into one of five risk groups that accurately predict the risk of death within 30 days: very low risk, low risk, average risk, high risk and very high risk. All the patients who died within 30 days of admission were identified. Further details of the methods used have already been published [12].

At that time of this study Nenagh Hospital was a small general hospital in rural Ireland serving a population of 60,000. It had a 36-bed acute medical unit, with 2800 admissions per year, almost all of which were unplanned emergencies. It was served by three fully trained consultant physicians, each assisted by a team of three physicians in

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training; each team was on-call every third day. The hospital had a five-bed ICU capable of cardiac monitoring, external and temporary transvenous pacing, non-invasive and invasive ventilation, etc. Approximately two-thirds of medical patients were referred for admission by their family doctor and the rest presented themselves for admission as emergencies. The decision to admit self-referred patients was made by the doctor in training on call, usually following suggestions made by the head nurse in the emergency department. A detailed analysis of the differences between doctor-referred and self-referred patients and their outcomes using this system has already been published [13]. Since 2010 the hospital has been reconfigured and no longer provides acute medical care.

Statistical significance was set at a p value <0.05 and tested using Student's t -test, linear regression and Chi-square analysis using Epi-Info versions 6.0 and 7.0.

Ethical approval of the study was obtained from the Mid-Western Regional Hospital Complex Scientific Research Ethics Committee, which granted exemption for patient consent.

3. Results

Over the study period of 1442 days 9435 patients were admitted (i.e. 6.5 patients per day or 0.3 per hour). There was considerable fluctuation in the number of patients admitted per day: for example, during the first 183 days of the study the number of patients admitted per day ranged from 0 to 19 patients (Fig. 1). Most patients (72.1%) were admitted between midday and midnight: 9.1% between 1 am and 6 am, 18.9% between 7 am and 12 noon, 47.3% between 1 pm and 6 pm, and 24.8% between 7 pm and midnight.

Patients waited 37.6 SD 53.1 min after admission before they were seen by a doctor. However, this delay did not have a normal distribution as 21% of patients were seen within 10 min, 41% within 20 min and 52% within 30 min. The median delay before seeing a doctor varied according to the time of day, ranging from 16 min between 1 am and 6 am to 29 min between 1 pm and 6 pm. There was a linear correlation between the delay before seeing a doctor and the time of admission ($\text{DELAY} = 0.59 * \text{TIME OF DAY} + 26.6$, $r = 0.54$) and the number of patients admitted per hour (Fig. 2).

Approximately 35% of patients had a very low risk score and 5% had a very high risk score. The remaining patients were more or less equally divided into those with low, average and high risk scores (Table 1). These proportions were not greatly influenced by the time of day patients were admitted, except between midnight and 6 am when more than 50% of patients had very low risk scores and only 15% had high or very risk scores.

Patients who waited more than 80 min to see a doctor were older (65.8 SD 18.8 versus 61.5 SD 20.5 years, $p < 0.0001$) and had a slightly higher SCS on admission (2.5 SD 1.2 versus 2.4 SD 1.3, $p < 0.0002$). Overall and especially from 7 pm to midnight patients with a very low risk SCS were seen more quickly than patients with higher scores (Table 2). This was not a consistent

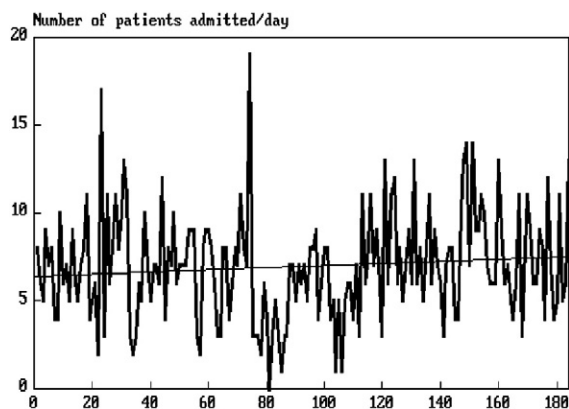


Fig. 1. Fluctuation in the number of patients admitted per day during the first 183 days of the study.

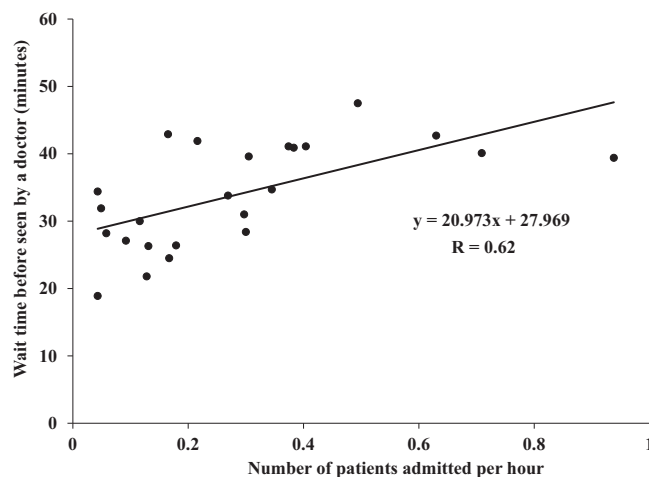


Fig. 2. Correlation between the delay before seeing a doctor and the number of patients admitted per hour.

finding throughout the rest of the day, but the median wait times for patients in different SCS risk groups suggest that in the evenings and early morning there was a bias towards seeing patients with a lower SCS more promptly (Fig. 3).

There was no significant difference in the wait before seeing a doctor of the 434 patients who died within 30 days and the 9001 survivors (40.2 SD 51.6 median 25.0 range 0–420 versus 37.5 SD 53.2 median 25, range 0–1440 min, $p = 0.29$). Most patients (8340) were seen within 80 min (median delay 20 min, range 0 to 79 min). However, the 1095 patients who waited 80 min or more to see a doctor (median delay 120 min) were more likely to die (odds ratio 1.36 95% CI 1.03–1.81, $p = 0.03$) than the 8340 patients seen sooner (median delay 20 min). However, this excess mortality risk was confined only to those patient with a low risk SCS (Table 3).

4. Discussion

This study reports the time patients arrived in hospital and the time they were seen and clerked by a doctor in a small rural hospital prior to reconfiguration of the Irish health service. The majority of patients were seen within half an hour and only 53 very high risk patients waited more than 80 min. In most instances the doctor would have been a doctor in training with limited experience, so it cannot be assumed that being seen by a doctor coincided with the start of the correct or appropriate treatment. Although the impact of delayed care seems small and, paradoxically, undetectable in the sickest patients, it would appear that being seen and clerked promptly is of benefit. Extrapolation of our results suggests that the average UK 7 hour delay in clerking [7] would produce a threefold increase in risk of death for all patients, and a tenfold increase for low risk patients.

At the time of this study Nenagh Hospital was a physically small unit and, although there were occasional surges in the number of patient admitted, on average only 0.3 patients per hour were admitted to the hospital. There were, therefore, almost no opportunities for “access block” to the hospital or delays from transporting patients between different wards or hospital departments, or other bureaucratic or administrative delays after arrival in the hospital.

Although prompt care improves outcomes for patients with acute myocardial infarction, stroke, infection and shock, there is surprisingly little evidence for its value in other conditions. Indeed, aggressive treatment of albeit high risk patients may be counter-productive [14,15]. Our finding that low risk patients were disadvantaged the most by waiting to be seen by a doctor cannot be explained by the small differences in age and SCS. However, many of these low risk patients were suffering from conditions such as unstable coronary artery disease and bacterial infections well known to benefit from prompt treatment (see Table 4).

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