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ORIGINAL ARTICLE

Profiling frequent attenders at an inner city emergency department

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Abstract

Background Emergency department (ED) frequent attenders (FAs) have a higher rate of adverse outcomes compared to infrequent attenders.

Aims The primary aim was to describe the prevalence of FAs at an inner city ED. A subgroup analysis was undertaken for high and very high FAs to establish demographics and other factors which might cause them to attend frequently.

Methods A retrospective review of all patients who attended the ED at Mercy University Hospital (MUH), Cork, during 2016 was undertaken. Patients were classified as either infrequent attenders (1–2 attendances/year), frequent attenders (3–12 attendances/year), high frequent attenders (HFA, 13–29 attendances/year), or very high frequent attenders (VHFA, > 30 attendances/year).

Results During 2016, a total of 21,920 patients presented 33,152 times. Overall, 90.2% ($n = 19{,}761$) were infrequent attenders, whilst 9.6% ($n = 2115$) were FAs. A further 36 patients (0.16%) were HFAs and eight patients (0.04%) were classified as VHFAs. Almost 10% of patients attended the ED three or more times, accounting for 29% of overall ED attendances. The HFA and VHFA cohorts were predominantly male (79.5%, $n = 35$) with an average age of 49.6 years. They were found to have multiple medical comorbidities, complex psychosocial problems, and a mortality rate of 11.3% over a 2-year period.

Conclusions This retrospective review is the most detailed assessment of Irish FAs undertaken to date. Further studies are required to examine the Irish hospitals most at need of Case Management Strategy Programmes which we postulate could minimise the risk of adverse outcomes for these patients and improve overall ED efficiency.

Keywords Emergency medicine · Psychiatry · Vulnerable patients

Introduction

With our ageing population, chronic emergency department (ED) overcrowding, and long-term understaffing, EDs are under more pressure than ever before. The number of ED presentations has been climbing worldwide [1–4], and with this, a significant rise has been noted in the number of patients who repeatedly attend the ED, the so-called frequent attenders (FAs) [5]. There is no universally agreed threshold as to what constitutes a FA [6]; however, patients may be considered broadly as being either infrequent (1–2 ED attendances/year), frequent (3–12 ED attendances/year), high frequent (13–30 ED attendances/year), or very high frequent attenders (> 30 ED attendances/year). In the UK, the Cambridge University Hospital Trust reports that their rate of FAs has increased from 3.7 to 9.3% over a 15-year period [5]. This growing group of patients presents complex challenges to those working to improve ED efficiency and deliver safe, timely, patient-centred care.

Each FA has his or her own unique set of needs which appears to remain unmet despite multiple encounters [3], making them some of the most vulnerable patients attending the ED [7]. The Royal College of Emergency Medicine (RCEM) highlights that these patients may struggle to access other services [5]. Indeed for some, attendance at the ED may be their only medical interaction, but despite this, they are often suboptimally managed. They are frequently seen by different doctors on each presentation and unfortunately both under and over investigation and treatment are common [2, 5]. A systematic review of 31 studies concluded that patients who

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frequently present to an ED have a higher rate of adverse outcomes including mortality, admission, and outpatient visits in contrast to non-frequent ED attenders [4].

Previous Irish studies of ED FAs have been primarily single-centre descriptive studies based in Dublin [8–11] with one further study conducted in a rural population in the West of Ireland [4]. To date, no study has captured baseline epidemiological data on the ED FA population in Cork, Ireland's second largest city. In previous studies, Irish FAs have tended to be eligible for the General Medical Services (GMS) scheme [9, 10], meaning they are entitled to a range of medical services at no cost to themselves. They have also been found to have more frequent contact with other medical services including public health nurses, psychiatric services, social workers, and addiction services [9, 12]. A recent study at St. James's Hospital, Dublin, stated that 41% of patients with 12 or more ED presentations per year were homeless [13].

The primary aim of this study was to describe the prevalence of ED FA at an inner city ED in the south of Ireland. A subgroup analysis was then undertaken for the high and very high FAs to establish patient demographics, the times when these patients are most likely to present to the ED, medical and psychiatric comorbidities, substance misuse problems, their behaviour within the ED, and other factors which might cause them to attend more frequently.

Methods

Study setting

Cork is Ireland's largest county and second largest city. According to the 2016 census, the county has a total population of 542,868 with 125,622 of those people living in the city. Emergency care for the region is delivered through two EDs (Mercy University Hospital [MUH] and Cork University Hospital [CUH]), three Local Injury Units at Bantry, Mallow, and Mercy urgent care centres, and two Medical Assessment Units at Bantry and Mallow urgent care centres. Data for this study was collected at the MUH, Cork, which treats approximately 33,000 patients annually and is located in Cork City centre.

Data collection and analyses

A retrospective review of all patients who attended the ED at MUH between 1 January 2016 and 31 December 2016 was undertaken by interrogation of the hospital in-patient management system (iPMS). Patients were classified as being infrequent attenders (1–2 attendances/year), frequent attenders (3–12 attendances/year), high frequent attenders (HFA, 13–30 attendances/year), or very high frequent attenders (VHFA, > 30 attendances/year).

ED and in-patient clinical records were then obtained for all patients in the HFA and VHFA cohorts. Data captured included patient demographics, time and day of each attendance, referral source, triage category, presenting complaint, and disposition. The three most recent ED charts for each of these patients were analysed, and information was recorded relating to housing, comorbidities, substance use, and other psychosocial factors which may affect the frequency of their ED attendance. The hospital's electronic laboratory and radiology systems were explored to identify how many investigations these patients had in the year 2016.

The liaison psychiatry team reviewed the psychiatry clinical records of the HFA and VHFA group to establish the following: whether the patients received a psychiatric assessment by the Cork City Mental Health Service (North and South Lee Mental Health Services), the presence of a mental disorder (ICD-10 F00-F99), any Mercy Hospital liaison psychiatry or community mental health team involvement in 2016, the presence of a self-harm act or completed suicide.

Lastly, the iPMS was further analysed to determine how many times these patients had attended the ED at MUH in 2015 and 2017 as well as how many times they attended ED at CUH, the only other acute hospital in Cork City.

As data was collected, it was anonymised and recorded on an Excel Spreadsheet. The numbers of patients in each of the groups (FA, HFA, and VHFA) were expressed as percentages of the total numbers of patients attending the ED. Simple descriptive statistics were used in the analysis of demographics, homelessness, mortality, and medical and psychiatric comorbidities.

Narrative synthesis

The three most recent ED cards for each patient were analysed, and any note made by ED staff which indicated that the patient was difficult, aggressive, or exhibiting challenging behaviour either with prehospital staff or in the department was recorded. The exact note made by staff was recorded as a quote, and a sample of these quotes is presented in the results below.

Results

Classification by attendance frequency

During the year 2016, a total of 21,920 patients presented to MUH ED 33,152 times (Table 1). Overall, 90.2% ($n = 19{,}761$) of these patients were infrequent attenders whilst another 9.6% ($n = 2115$) were FAs. A further 36 patients (0.16%) were classified as HFAs and accounted for 636 ED presentations. Finally, eight patients (0.04%) were classified as VHFAs with

Table 1 Breakdown of patients by attendance category

	Number of patients	Number of presentations
Infrequent attender 1–2 MUH ED visits per year	19,761	23,533
Frequent attender 3–12 MUH ED visits per year	2115	8525
High frequent attender 13–30 MUH ED visits per year	36	636
Very high frequent attender > 30 MUH ED visits per year	8	462
Total	21,920	33,156

462 presentations in total, an average of just over 1 presentation, per patient, per week.

High frequent and very high frequent ED attenders

This cohort of 44 patients collectively created 1098 ED presentations.

Demographics

The average age of the HFA and VHFA group was 49.6 years (range 21–78 years). These patients were predominantly male (79.5%, $n = 35$). In total, 75% ($n = 33$) of them were GMS medical card holders whilst only 4.5% ($n = 2$) had private health insurance. The remaining 21.5% ($n = 7$) held neither a GMS medical card nor a private health insurance, but like all Irish citizens, they receive public healthcare at minimal or no cost to themselves. Patients who do not have a GMS card and do not show a referral letter when they present to ED are subject to a €100 charge.

Homelessness

Overall, homeless patients accounted for only 1.3% ($n = 289$) of all patients who attended the ED during 2016, but half (50%, $n = 22$) of HFAs and VHFAs were found to be homeless.

Patient mortality

A single patient from this group died during the year 2016 but a further four patients died during the year 2017. This results in a total mortality of one in nine (11.3%, $n = 5$) for these patients over the 24-month period from January 2016 to December 2017. The average age of patients who died was 61.6 years (range 32–78 years) and 80% ($n = 4$) were male.

Time of ED presentation

HFA and VHFAs most commonly presented to ED outside of normal working hours. In total, 19.7% ($n = 217$) of presentations were between 00:00 and 07:59; 30.1% ($n = 331$) were between 08:00 and 15:59; and 50.1% ($n = 550$) were between 16:00 and 23:59.

Thursday was the weekday with the highest number of presentations ($n = 184$, 16.8%) whilst May (9.8%, $n = 108$) and November (9.8%, $n = 108$) were the months with the most frequent attendances (Fig. 1).

ED patient arrival

With regard to arrival at ED, the majority of patients (59.2%, $n = 650$) arrived by emergency ambulance. Other modes of arrival included "walk-in" (35.0%, $n = 384$) and private car (5.3%, $n = 58$). Only 6.2% ($n = 68$) of patient presentations were referred by a general practitioner or other healthcare providers.

ED triage category and presenting complaint

At triage, these patients were predominantly assessed as being category three (30.2%, $n = 332$) and four (22%, $n = 242$) on the Manchester Triage System. The presenting complaints varied widely but a significant proportion is related to psychosocial problems.

The top three most common presenting complaints included "apparently drunk" (28.8%, $n = 316$), "unwell," (25.2%, $n = 277$), and "mental illness/behaving strangely" (8.1%, $n = 90$) (Fig. 2).

Disposition

Only 9%, ($n = 99$) of these presentations culminated in admission to MUH. Two thirds of patients (66%, n=725) were discharged from the ED and almost one quarter (24%, n=264) left the ED before completion of treatment. Overall, 91.2% ($n = 593$) of those who arrived at ED by ambulance were ultimately either discharged home from the department or left before completion of treatment. The mean ED length of stay was 7 h 27 min (range 0 h 0 min–23 h 29 min), per visit.

Investigations

In total, these 44 patients collectively underwent 11 ultrasound scans, 38 CT scans, 155 chest radiographs, 88 other plain

radiographs, and 402 laboratory tests in MUH ED during the study period (2016).

Medical comorbidities

The majority (81.8%, $n = 36$) of these patients had medical comorbidities or history of a significant medical condition recorded. The most commonly reported comorbidity was a history of seizures, epilepsy, or a known seizure disorder which was recorded for one quarter of patients (25%, $n = 11$). A total of six patients had chronic liver disease including two with viral hepatitis. A history of cancer was recorded for three patients (7.5%); two had prostate cancer whilst the remaining patient had lung cancer. Ischaemic heart disease, atrial fibrillation, and heart failure were all reported in a number of patients (Table 2).

Psychiatry

The majority of the patients in the HFA and VHFA groups (79.5%, $n = 35$) had a record of previous psychiatric assessment by the Cork City Mental Health Service (North and South Lee Mental Health Service). All the patients who were assessed suffered from a mental or behavioural disorder (ICD-10 F00-F99). None of them had a diagnosis of a severe and enduring mental illness (e.g., severe mood disorder or psychotic disorder). Seventy-four percent ($n = 26$) had a diagnosis of mental and behavioural disorders due to psychoactive substance use (ICD-10 F10-19), predominantly alcohol or benzodiazepine related.

In the group with a diagnosis of a substance abuse disorder ($n = 26$):

- 65.5% ($n = 17$) did not have any other mental disorder
- 11.5% ($n = 3$) also had a diagnosis of a mood disorder (ICD-10 F30-39)
- 11.5% ($n = 3$) also had a diagnosis of an anxiety disorder (ICD-10 F40-49)
- 11.5% ($n = 3$) also had a diagnosis of a personality disorder (ICD-10 F60-69)

For the group without a substance abuse disorder ($n = 9$):

- 22.2% ($n = 2$) had a diagnosis of an anxiety disorder (ICD-10 F40-49)
- 55.5% ($n = 5$) had a diagnosis of a personality disorder (ICD-10 F60-69)
- 22.2% ($n = 2$) had a diagnosis of mental retardation (ICD-10 F70-79)

In 2016, the liaison psychiatry service assessed 47% of the HFA and VHFA cohort ($n = 21$) during a presentation to the MUH ED. This amounted to 129 separate assessments over the year. Only 18% ($n = 8$) of the group were actively attending a community mental health team in 2016. In total, 14% ($n = 6$) of the group presented to the emergency department following an act of self-harm, and one person died by suicide during 2016.

Of the 9 patients who did not have a recorded psychiatric assessment by the Cork City Mental Health Service, all of them (100%, $n = 9$) either had a history of alcohol or substance misuse recorded on their ED notes or had recurrent presentations whilst intoxicated.

Behaviour in ED

In total, half of the patients (50%, $n = 22$) were noted to exhibit challenging behaviour in at least one of their three most recent ED charts. These notes described behaviour which ranged from declining assessment or treatment ("difficult to assess"; "declined examination/assessment"; "refused vitals") to aggressive or threatening behaviour towards staff ("verbally aggressive"; "threatening staff"; "patient produced a knife and made threats to EMTs and hospital staff pre-arrival"). One patient was noted to have alcohol in the department which they refused to surrender to security whilst others made demands of staff: "demanding his night medication"; "demanding food"; "insisting she have a shower".

Annual variation in attendance pattern

This cohort of 44 patients was collectively responsible for 758 presentations to MUH ED in 2015, 1098 presentations in 2016, and 916 presentations in 2017. Many of this patient group also frequently attended the ED at CUH. When cross-referenced with the iPMS in ED CUH, the group made 196 presentations to CUH ED in 2015, 367 in 2016, and 158 in 2017. Collectively, this cohort created 3489 ED presentations across the two hospital EDs over the 3-year period from 2015 to 2017.

Discussion

This retrospective review is the most detailed assessment of Irish FAs undertaken to date. It demonstrates an overall prevalence of frequent attenders (FA, HFA, and VHFA combined) of 9.6% in this urban population. It also confirms that the patients who attend ED most frequently (HFA and VHFA) are vulnerable in terms of having multiple comorbidities, complex psychosocial problems, and a high mortality rate.

We found that almost 10% of patients attended the ED three or more times during 2016, accounting for 29% of overall ED attendances. This is comparable to a study by Lacalle et al. in the USA which found that 4.5–8% of patients contribute 21–28% of ED attendances [1]. This disproportionate

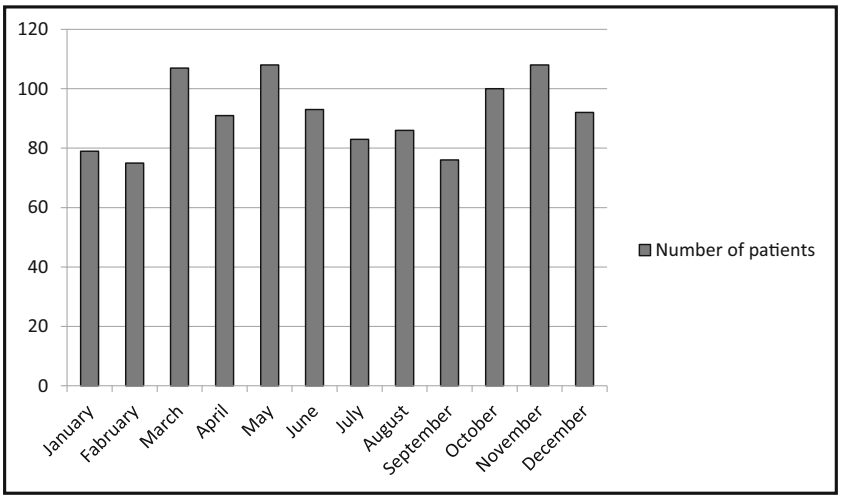

Fig. 1 HFA and VHFA ED presentations by month

number of presentations by a small group of patients has a significant impact on the cost and efficiency of providing emergency care [14]. In addition to the care provided in ED, the majority of these patients arrived by ambulance which likely caused significant strain on the National Ambulance Service. Given that less than 10% of those who arrived by ambulance required admission to hospital, perhaps, many of these emergency ambulance transfers may have been avoidable had alternative pathways been available to address their needs.

International studies have shown that despite differing healthcare systems, many of the characteristics of this population remain constant [9] and our data is generally in keeping with these findings. This study adds to the literature which suggests that these patients tend to be from poor socioeconomic backgrounds and have complex psychosocial difficulties including substance abuse disorders [6, 8, 10]. They have previously been shown to have a high burden of chronic disease which is likely to drive their repeated attendances [15], and this is also reflected in our study with high rates of medical and psychiatric comorbidities. Most striking perhaps is the death rate of 11.3% for this cohort which confirms that despite frequent encounters with medical staff, these patients have complex needs which largely appear to remain unmet.

Their presenting complaints at triage tend to be vague with "unwell" featuring as the second most common complaint. This likely reflects the fact that these patients present with a host of multifactorial problems which can be vague and take a large amount of time to tease out. This is reflected in a long average length of stay in the ED (almost 7.5 h) and is likely compounded by the fact that these patients most frequently present outside of normal working hours. This may make it more difficult to link them in with social work, addiction services, and other services which do not operate on a 24/7 basis. Unfortunately, the fact that many of these patients exhibit challenging behaviour in ED is likely to hamper staff in their attempts to identify the underlying drivers for repeated presentations.

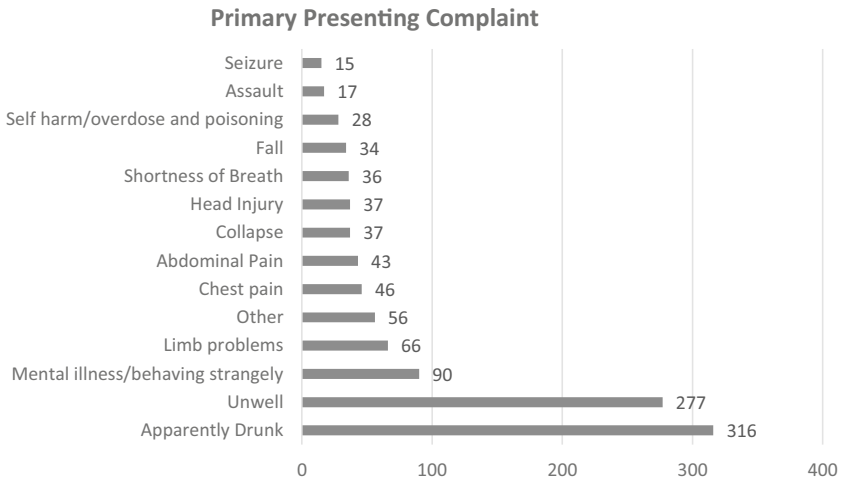

Fig. 2 Breakdown of presentations by presenting complaint for HFA and VHFA

Table 2 Five most common medical comorbidities

Condition	No. of patients	% of patients
Seizures or epilepsy	11	25.0
COPD	6	13.6
IHD	6	13.6
Chronic liver disease	6	13.6
Hypertension	4	9.1

Previous studies have suggested that many FAs do not present regularly but tend to experience crisis periods which manifests as occasional increased frequency of presentations [5, 16]. A natural attrition rate has been described amongst FAs with one study showing that only 38% of patients with 4 or more attendances in 1 year are likely to be FAs the following year [17]. However, a small subset of patients continue to frequently attend year after year, and the attrition rates are much lower for these chronic FAs [17]. In our study, the same individual patient was the most frequent attender in MUH across 2015, 2016, and 2017. In addition, 24 of the 44 patients from the 2016 HFA and VHFA cohort met criteria for HFA and VHFA in 2015 and 22 of the 44 patients met the criteria for 2017. This suggests that perhaps patients in our population are at greater risk of becoming chronic FAs.

The Irish National Emergency Medicine Programme (NEMP) acknowledges the vulnerability of FAs and recommends identification of these patients and use of patient-specific care plans in their management [18]. RCEM makes similar recommendations and advises that patients should be involved in the development of their own care plan where possible [5]. Now that these patients have been identified in MUH, a strategy must be employed to improve their care, increase the necessary supports, and empower them to present to ED less frequently. Options include ED care plans, case management strategies, and multidisciplinary team engagement with primary care practitioners and other key stakeholders in community and addiction services. None of these strategies are supported by an overwhelming body of evidence, but case management strategies have shown the most promise [3, 16, 19, 20]. This is a multidisciplinary approach to the management of FAs incorporating both hospital and community services and aims to address each patient's individual needs [21].

This study is limited by the fact that it is a single-centre, retrospective view. However, it serves as a springboard for further epidemiological studies of FAs in Ireland with a view to identifying EDs at greatest need of introducing a Case Management Strategy Programme. We postulate that this would have a dual benefit of both minimising the patients' own risk of adverse outcomes and the burden of frequent attendances on the acute healthcare system.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by any of the authors.

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