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Local trends in older people presenting at an emergency department

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Local trends in older people presenting at an emergency department

Abstract

Background Emergency Departments are increasingly reporting difficulties in managing their patient load within the available resources. Older people contribute significantly to the number of presentations seen in Emergency Departments. Understanding the nature of presentations can help to appreciate how they might be best managed to assist in effective resource utilisation and patient care.

Aim This study aimed to explore presentations to an outer metropolitan Emergency Department by older people.

Design Retrospective review of all Emergency Department presentations of individuals aged over 65 years.

Participants 8469 older individuals who presented to an outer metropolitan Emergency Department between July 2013 and September 2014.

Methods Medical record data items included demographics, triage category, presenting problem(s), disposition and length of stay.

Findings 14,976 Emergency Department presentations were made by 8469 older people. High attenders (n = 405 older individuals) accounted for 18.7% (n = 2798) of the total presentations. Almost half of the presentations (48.9%) were triaged as Category 3 presentations, with a further 29% triaged as Category 4. Whilst overall the most frequent discharge diagnoses were chest pain (3.8%), fall (3.0%) or COPD (2.9%), for the high attenders the most frequent discharge diagnoses were COPD (6.4%), chest pain (4.0%) and fall (3.1%). Only 54.2% (n = 8124) of all presentations led to a hospital admission.

Conclusion Our data demonstrated that a proportion of presentations to the Emergency Department by older people could be reduced as many individuals did not require hospital admission. This would alleviate burden on the Emergency Department and potentially improve continuity of care and outcomes. Further research needs to explore the reasons that older people present to Emergency Departments rather than using other services and explore how primary care services can better meet these health needs. Additionally, educational strategies need to be implemented to improve consumer decision making about which health services they access and empower consumers to better manage their health.

Disciplines

Medicine and Health Sciences | Social and Behavioral Sciences

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Local trends in older people presenting at an emergency department

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Competing interests

None declared.

Abstract

Background: Emergency Departments are increasingly reporting difficulties in managing their patient load within the available resources. Older people contribute significantly to the number of presentations seen in Emergency Departments. Understanding the nature of presentations can help to appreciate how they might be best managed to assist in effective resource utilisation and patient care.

Aim: This study aimed to explore presentations to an outer metropolitan Emergency Department by older people.

Design: Retrospective review of all Emergency Department presentations of individuals aged over 65 years

Participants: 8,469 older individuals who presented to an outer metropolitan Emergency Department between July 2013 and September 2014.

Methods: Medical record data items included demographics, triage category, presenting problem(s), disposition and length of stay.

Findings: 14,976 Emergency Department presentations were made by 8,469 older people. High attenders (n=405 older individuals) accounted for 18.7% (n=2,798) of the total presentations. Almost half of the presentations (48.9%) were triaged as Category 3 presentations, with a further 29% triaged as Category 4. Whilst overall the most frequent discharge diagnoses were chest pain (3.8%), fall (3.0%) or COPD (2.9%), for the high attenders the most frequent discharge diagnoses were COPD (6.4%), chest pain (4.0%) and fall (3.1%). Only 54.2% (n=8,124) of all presentations led to a hospital admission.

Conclusion: Our data demonstrated that a proportion of presentations to the Emergency Department by older people could be reduced as many individuals did not require hospital admission. This would alleviate burden on the Emergency Department and potentially improve continuity of care and outcomes. Further research needs to explore the reasons that older people present to Emergency Departments rather than using other services and explore how primary care services

can better meet these health needs. Additionally, educational strategies need to be implemented to improve consumer decision making about which health services they access and empower consumers to better manage their health.

Key words: Chronic Disease; Elderly; Emergency Department; Primary Care

Introduction

The age composition of Australia's population is projected to change considerably in coming years as a result of population ageing. In 2011, people aged 65 years and over comprised 13.7% of Australia's population (Australian Bureau of Statistics, 2011b). By 2056 this proportion is projected to increase to between 23-25% and to 25-28% by 2101 (Australian Bureau of Statistics, 2008). In addition to being an increasing proportion of the population, those aged over 65 years will also increase in absolute numbers in the coming years (Chu, Brown, & Lukin, 2009).

As the proportion of older people increases and the prevalence of chronic and complex disease rises, there will be a growing demand for health services. Older individuals use disproportionately more health resources than younger individuals (Chu et al., 2009). This phenomenon is, perhaps, apparent nowhere more obvious than in the Emergency Department (ED) (Ballabio et al., 2008). The ED is a major portal of entry to the acute health system, with access facilitated by the department being always open and the financial affordability of attendance. Whilst the ED provides ready access to health providers, all EDs are under constant time pressures and manage a variety of complex problems, as well as being faced with many presentations which could potentially be managed in primary care settings (Fatovich & Hirsch, 2003). Elderly patients discharged from the ED are at higher risk of short

term negative outcomes including, hospitalisation, functional decline, remission to the ED and death than younger patients (Ballabio et al., 2008). Therefore, there is a need to promote a model whereby individuals seek the right provider in the right circumstances to optimise their treatment and continuity of care whilst at the same time appropriately using finite health resources.

The number of ED presentations in older people is predicted to increase sharply in the near future as the numbers of older people grows (Siminski, Bezzina, Lago, & Eager, 2008). However, ED utilisation has already increased over the past decade, with the issue of ED overcrowding becoming commonplace and frequently reported in the mainstream media (Asplin et al., 2003; Bernstein et al., 2009; Richardson, 2009). ED crowding results in delays in treatment, longer stays, worse patient outcomes, and higher mortality rates (Asplin et al., 2003; Bernstein et al., 2009; Richardson, 2009). As a strategy to manage this potentially increasing burden on EDs, there is growing interest in investigating less urgent attendances at the ED. Siminski et al. (2008) have identified that primary care presentations or less urgent attendances by the elderly to ED have increased more rapidly than in other age groups in recent years. This paper explores the patterns of attendance of older persons at one outer metropolitan ED in South Western Sydney. In particular, it explores the differences between those who were admitted to hospital with those who were discharged from the ED.

Methods

Design and Setting

A retrospective medical record audit was conducted at a major public teaching hospital located in outer Metropolitan Sydney, New South Wales Australia. At the time of this study this Hospital had between 200 and 500 beds and served a local population of some 150,000 (Australian Bureau of Statistics, 2011a; National Health Performance Authority, 2015). The ED had 40 beds and on average had 159 ED presentations per day (New South Wales Ministry of Health, 2013).

Patients

This study involved all ED attendances of older people who presented between July 2013 to September 2014. This time period was selected to minimise the impact of seasonal variation in admission rates / ED attendances. Attendances were identified from the FirstNet clinical information system.

Data collection

Electronic data was provided by the hospitals' clinical information department via the ED Data Manager.. Retrieved data fields included; gender, age, residential postcode, country of birth, presenting problem, admission status, mode of separation, referrals provided and length of stay. To facilitate linking of presentations to particular individuals the medical record numbers were retained in the dataset during analysis. All data were de-identified once this matching was undertaken. As all data is reported in an aggregated format individual consumers cannot be identified.

Data analysis

Data were imported from the Microsoft Excel spreadsheet into the Statistical Package for the Social Sciences Version 20 for analysis. Descriptive statistics were calculated and are presented as percentages. Chi-square tests and z-score tests for two sample proportions were performed to determine significant differences in proportions among categorical variables such as triage categories (1 to 5) and gender (male and female). Mean differences in average length of stay between triage categories were calculated using Analysis of Variance (ANOVA) test with post-hoc Tukey's test. Age and gender adjusted odds of an ED presentation leading to an admission to a hospital ward as well as adjusted odds of a patient's length of stay in the hospital being greater than or equal to 24 hours or not, were calculated using binary logistic regression tests for all triage categories and are presented as adjusted odds ratios (with 95% confidence intervals).

Ethics

Approval for the conduct of the study was gained from the ##### Human Research Ethics Committee (Approval No. 14/269).

Results

Demographics

14,976 ED presentations were made by 8,469 older people during the study period. 53.7% presentations were made by female patients (n=8042). The mean age of presenting patients was 75.9 years (Oldest 105yrs; SD=8.932). Female patients

(Mean=76.98, SD=9.3) had a significantly higher mean age than male patients (Mean=74.6, SD=8.32, $p<0.001$). The 65-74 year old age group had the highest proportion of presentations within the study period, comprising 39.6% of total presentations.

Triage category

Almost half of the presentations (48.9%) were triaged as category 3 presentations using the Australasian Triage Scale (Commonwealth Department of Health and Family Services and the Australasian College for Emergency Medicine., 1997), meaning that assessment and treatment should be undertaken within thirty minutes in a target of 75% of cases (Australasian College for Emergency Medicine., 2013). A further 29% triaged as category 4, meaning that assessment and treatment should be undertaken within sixty minutes in a target of 70% of cases (Australasian College for Emergency Medicine., 2013) (Table 1). Triage 3 category presentations were the predominant triage category for all age groups. The presentations were evenly split between after-hours presentations (50.1%) and normal business hours presentations (49.9%).

There was a statistically significant difference in the triage specific presentation proportions between males and females ($\chi^2=35.186$, $df=4$, $p<0.001$). There was a significantly higher proportion of male presentations in triage categories 2 and 5 compared to the proportion of female presentations of triage category 2 ($z=2.649$, $p=0.0081$) and triage category 5 ($z=4.607$, $p<0.001$). However, in triage category 4 there was a significantly higher proportion of female presentations than male triage 4 presentations ($z=3.415$, $p=0.0006$).

There was a statistically significant difference in the triage specific presentation proportions between after-hours presentations and normal business hours presentations ($\chi^2=24.092$, $df=4$, $p<0.001$). The proportion of after-hours triage category 2 presentations was significantly higher than the triage category 2 presentations within normal business hours ($z=3.313$, $p=0.0009$). However, the proportion of triage category 3 ($z=2.027$, $p=0.0426$) and triage category 4 ($z=3.465$, $p=0.0005$) presentations were significantly higher within normal business hours than after-hours.

Admissions

The rates of admission into an acute ward as a result of ED presentation were strongly and inversely correlated with the triage category of the presentation ($r=-0.997$). Overall 54.2% ($n=8,124$) of all presentations led to a hospital admission. Almost 96% of all triage 1 presentations led to hospital admission, compared to just 12% of all the triage 5 presentations resulting in admission to a ward. Of the 4,987 Triage category 4 and 5 presentations, only 35.1% ($n=1751$) resulted in a hospital admission.

Length of stay

Overall the average length of stay in hospital for all admissions (calculated from leaving ED to hospital discharge time) was 4.3 days with 66.4% of all admissions being for 24 hours or more.

There was statistically significant difference in the average length of stay between the triage categories ($F=3.041$, $p<0.016$)(Table 1). Post-hoc Tukey's test concluded that

triage 4 admissions had a statistically significantly higher average length of stay than triage 2 category presentations that led to admissions. Effect estimates, expressed as odds ratios, after controlling for age and sex, indicate an increasing likelihood of admission as the presentation triage category decreases.

****INSERT TABLE 1 HERE****

High attenders

A total of 8,469 individuals accounted for the 14,976 ED presentations during the study period. While this equates to an average of 1.77 visits per patient; the number of multiple visits by an individual varied across age groups and was influenced heavily by the patients who presented more than four times in the data collection period. Whilst only 405 patients (4.8%) had presented to the ED more than four times (high attenders), this group accounted for a total of 2,798 presentations or 18.7% of the total presentations. The visits per patient reduced significantly ($p < 0.001$) at all age groups and overall (mean visits after high attenders removed 1.51) after removing the *high attenders* from the sample.

The age of the high attenders was fairly evenly split between the 65-74 years (33.6%), 75-84 years (33.3%) and 85 years and over age groups (24.7%). The pattern of triage category amongst the high attenders was not dissimilar to the whole cohort, with just over half of the presentations being triaged as Category 3 (52%) and 28% triaged as Category 4.

Discharge diagnoses

Although chest pain accounted for the biggest proportion of discharge diagnosis overall (575 or 3.8% of all presentations), amongst the high attender visits the most common discharge diagnosis was chronic obstructive pulmonary disease (COPD) (179 or 6.4% of the 2798 high attender presentations). The major discharge diagnoses for the whole sample and the high and low attenders separately are presented in Table 2.

****INSERT TABLE 2 HERE****

Discussion

Nearly half of the ED presentations by older people in this study did not result in a hospital admission. As these presentations did not require admission it can be postulated that they could potentially have been managed in primary care settings. Management in primary care would have both reduced the burden on the ED and provided continuity of care with the regular general practice. Research supports the notion that a substantial proportion of older adults presenting to the ED could likely be managed in a less resource-intensive setting (Gruneir, Silver, & Rochon, 2011). Estimates of the proportion of avoidable presentations in older people vary widely, from 6% to 61% (Mytton et al., 2012). Whilst a number of initiatives have been implemented in recent years to strengthen primary care service delivery, such as after-hours general practice clinics and telephone advice lines, older people with low acuity are still presenting to the ED (Mytton et al., 2012). These low acuity presentations represent a potential target group whereby to reduce the pressure on EDs. However, further research is required to identify key indicators beyond triage

category that can assist in differentiating those who require ED presentation and hospital admission versus those who can be safely and appropriately managed in the primary care setting.

Interestingly, our data evidences that presentations in triage category 3 and 4 occur more frequently during business hours when primary care services are open.

Similarly, Nagree et al. (2013) found that more general practice type patients presented during the weekdays. This is in contrast with van der Linden et al. (2014) who reported that only one-third of the patients who self-referred to the ED did so during office hours. In their study of consumers reasons for presenting to the ED, Masso et al.(2007) identified that the major reasons for consumers presenting to the ED were a perceived need for immediate attention, the convenience of seeing a doctor and having tests done in the same place and the problem being too complex to be managed by the general practice or medical centre.

The triage scale used in our study is clearly a measure of urgency rather than complexity of patient needs (Nagree et al., 2013). However, given the retrospective nature of our study this is the only available measure upon which to stratify the importance of presenting problems. Whilst older patients are likely to have complex needs as a result of their co-morbidities, the ongoing relationships, continuity of care and co-ordination of care provided by primary care have significant advantages in managing this patient group (Starfield, Shi, & Macinko, 2005). In their study of patient preferences regarding processes of care in multimorbidity, Bayliss, Edwards, Steiner, and Main (2008) found that patient centred and individualised care delivered by a primary contact person was highly desirable. Further research needs to look more closely at why the older people in studies such as ours present to the ED rather than

to their primary care providers. Such research should explore the range of issues such as access, availability and relationships with primary care providers, as well as specific diagnostic groups who could benefit from a targeted intervention.

Additionally, consideration should be given to potential primary care models that can support the health needs of these complex patients and strategies to educate older people, their family and carers about the most appropriate options for accessing health services that best meet their individual needs.

A key finding from our study was the relatively small number of high attenders who were contributing to a fairly large proportion of the ED presentations. Such a phenomenon has been previously described in the literature (Hastings et al., 2010). Šteinmille et al. (2015) propose that sociodemographic factors, social factors, health problems, need for systematic health assessment, healthcare service use and inadequacy of care provided contribute to repeat ED visits for older people. The absence of demographic differences between high and low ED attenders noted in our study and the literature (Hastings et al., 2010) evidences that the issues are likely complex and multifaceted. The implementation and ongoing evaluation of specific strategies to address the health and well-being needs of the high attenders represents a potentially cost-effective strategy for both reducing ED burden and improving the health management of these individuals. In NSW initiatives' have been implemented to provide ongoing support to these individuals, including; hospital in the home and integrated care, telemedicine, follow-up phone calls, outpatient clinics, Acute Geriatric Evaluation and Management Unit and In Safe Hands program (Audit Office of New South Wales, 2015). However, evaluation of the impact of such initiatives has been limited and so their effectiveness is not well understood (Audit

Office of New South Wales, 2015). Data from our study suggests that such programs have not fully addressed the need and, as such, should be re-evaluated to better meet the requirements of these older people. Future research needs to investigate self-management in older people and strategies to disseminate health information and health service availability to the ageing cohort.

Limitations

The retrospective nature of data collection and reliance on medical record data are clearly limiting factors in this study due to potential issues with the accuracy and completeness of the data. As purely a review of medical record data, the study failed to consider the complexity of older people living with and managing the symptoms of chronic and complex disease in the community. Additionally, we were unable to explore the local and personal reasons that prompted these individuals to present to the ED rather than their primary care providers. Future studies may be enhanced by collecting data prospectively, combining data from the medical record with an insight from the patient perspective to elucidate issues around the decision to present to the ED.

A further limitation is that this study was undertaken in a single outer metropolitan hospital. Local factors around access and availability of primary care services and community preferences for care may have impacted presentations to the ED. Collection of data at other EDs may result in different outcomes.

Conclusion

Many of the presentations to the ED by older people in this study were of low urgency and did not require hospital admission. Therefore, a proportion of these could have been managed in primary care. A small number of high attenders contributed to a significant proportion of ED presentations by older adults. Targeting this group of high attenders has significant potential to reduce ED burden and improve the quality of care and health outcomes of these individuals. Given the negative consequences of overcrowding in the ED this study provides evidence of a need to both explore the development of primary care services to address unmet need and to understand from a patients' perspective why they present to the ED rather than accessing alternate health care services.

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Table 1. Triage category, Hospital admission and Length of Hospital Stay (LoS)

Triage Category	Presentations		Admissions (Admissions with complete LoS data)	Proportion Admitted	Average LoS* (days)	Adjusted Odds Ratio of Admission (95% CI)	Adjusted Odds Ratio of LoS $\geq$ 24 hrs (95% CI)
	n	%					
1	171	1.14	164 (136)	0.959	4.7	155.8 (70.5-344.5)	14.9 (9.6-23.1)
2	2496	16.68	1965 (1776)	0.787	4.1	25.9 (20.1-33.5)	15.7 (11.3-21.9)
3	7313	48.86	4242 (3818)	0.58	4.4	9.3 (7.3-11.8)	9.0 (6.5-12.4)
4	4337	28.98	1672 (1472)	0.386	4.5	4.2 (3.3-5.4)	4.8 (3.5-6.7)
5	650	4.34	79 (71)	0.122	3.4	Reference group	

* Based on admissions that had complete LoS data. Days were calculated as the difference between hospital discharge time and ED check-out time

Table 2. Discharge Diagnoses

All presentations	High attender presentations (>4 presentations)	Non-high attender presentations (<4 presentations)
Chest pain (3.8%)	COPD (6.4%)	Chest pain (3.8%)
Elderly fall (3.0%)	Chest pain (4.0%)	Elderly fall (3.0%)
COPD (2.9%)	Elderly fall (3.1%)	Urinary tract infection (2.1%)
Urinary tract infection (2.3%)	Urinary tract infection (3.0%)	COPD (2.1%)
Falls (1.8%)	Dyspnoea or shortness of breath (2.7%)	Abdominal pain (1.8%)