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Research paper

The utilisation of one district hospital emergency department by people with Parkinson's disease

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ABSTRACT

Background: Parkinson's disease (PD) is the second most common neurodegenerative disorder in Australia and the economic burden is more than $8.3 billion a year and predicted to escalate. However, little is known of the trends and characteristics of people with Parkinson's disease presenting to emergency departments (ED).
Method: The study design was a 12 month retrospective medical record audit. The study was conducted in one metropolitan 300 bed district hospital in an outer suburb of Sydney.
Results: One hundred and twenty nine adult patients (0.4%) with PD presented with a mean age of 79.5 years (SD 7.7); all were over 60 years of age. Of the 129 PD patient cases, there were 260 separate ED episodes of care with the majority (n = 151; 58.1%) of patients living in the community and presenting with falls (n = 108; 41.5%). There was no statistical difference in triage code allocation when comparing PD patients and ED adult patients (over 60years). There was no difference in representation rate when comparing those over 80years (n = 128) with those under 80 years (n = 132). The average length of stay for PD patient episodes was 323 min (SD 225) compared with 193 min (SD 136) for ED patients. Younger adult patient episodes (n = 132; 51.0%) were admitted to hospital more frequently than those aged over 80 years (Pearson's X2 test 162.2; df 1; p < 0.001.
Conclusion: We identified in this study that people with PD have a high rate of falls, longer length of stay, high admission rate and represent frequently to the ED. Improved detection, management and a multidisciplinary approach for people with PD along with strict medication regime adherence is likely to improve safety, quality of life, reduce symptom aggravation and ongoing risk of falls.
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Introduction

The national economic burden of Parkinson's disease (PD) in the United States of America (USA) is estimated to exceed US$14.4 billion in 2010 [1]. A global estimate of the number of people with Parkinson's disease (PD) over the age of 50 years is between 4.1 and 4.6 million [2]. In those 80 years and older PD has a prevalence of 2% [3]. By 2030, this number is expected to double to between 8.7 and 9.3 million people. In Australia 30 people are diagnosed each day with PD [4]. To date the number of Australians with PD is estimated at 80,000 and similarly is predicted to treble to 240,000 by 2033 [5].

PD is the second most common neurodegenerative disorder after Alzheimer's disease. The risk of developing PD increases with age[3] and is characterised by a progressive degeneration of pigmented neurons in the substantia nigra in the mid brain [6]. This causes a deficiency in dopamine, which is responsible for controlled and smooth muscle movement. It is a complex condition with diverse clinical features, neuropsychiatric symptoms and non-motor manifestations, which include autonomic dysfunction, gastrointestinal dysfunction and pain [7]. The cardinal motor features of Parkinson's include, resting tremor, bradykinesia, rigidity and postural instability with the latter occurring later in the disease. A PD diagnosis is made when two of the three cardinal signs, bradykinesia, rigidity and tremor, are evident. The goal of PD treatment is to minimise symptoms and manage medicines side effects.

As a result, for patients who attend specialty clinics where their Parkinson's is managed by a specialist physician or nurse, the key focus is to, maintain independence, maximise medicine compliance and treat medication side effects [8,9]. However, the Emergency Department (ED) presentation is frequently managed by a non-specialist in PD, which may potentially result in suboptimal care

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as their condition can go undetected and unmanaged [6,9,10]. Evidence [9,11,12] suggests that a lack of specialist knowledge and adherence to PD medication regimes can result in worsening clinical outcomes, such as motor symptoms, prolonged recovery, falls, and morbidity. The delay in establishing the patients home medication regime and administering their medications on time places the PD patient at higher risk of adverse events. These adverse events can lead to increased hospital length of stay, representations rates and augmented costs [9,11,13–15].

Over 7.2 million attendances are managed by Australian EDs every year [16]. However, people with PD are a unique older person diagnostic group that present to EDs globally and are dependent on the clinician's assessment and recognition of the complexity of disease management. People with PD who present to the ED will usually have multiple co-morbidities [15] and so prompt identification, and timely and appropriate delivery of care is critical if optimal symptom control is to be achieved.

To date little is known or understood of the Australian ED trends and characteristics of people with PD. Therefore, the aim of this study was to describe the trends and characteristics of older people (60 years and over) with PD presenting to ED.

Methods

The study design was a 12 month retrospective medical record audit.

Site

The study was conducted in one metropolitan 300 bed district hospital in an outer suburb of Sydney, Australia, and the ED is a 22 bed referral centre.

Sample

A purposive sample of people with PD was enrolled in the study. Inclusion criteria required a diagnosis of PD (diagnosis determined by a neurologist and/or geriatrician) identified in the electronic medical record; 60 years of age or older; and living either in the community or in an aged care facility.

Medical record audit

A retrospective medical record audit was conducted between January 1st 2014 to December 31st 2014 of people with PD. Patients were identified using the emergency department computer software program (FirstNet™). FirstNet is an electronic medical record information system that is a repository for all ED patient clinical encounters. At the study site, the ED has embedded a PD icon in Firstnet. Clinicians activate the PD icon for all relevant presentations. Data collected includes patient demographics (age, gender) and ED clinical information (presenting information, time and mode of arrival to the ED, triage code, doctor seen by time, treating doctor, discharge diagnosis and disposition). The ED database was then temporarily cross matched with the Aged Care Services in Emergency Team database. To maximise identification of PD patients the ED data set was cross matched to the ASET database which comprises all PD patients assessed within the ED model.

The New South Wales Ministry of Health initiated a new model of care–Aged Care Services in Emergency Team (ASET) that specialises in the early assessment and treatment of older persons with complex care needs presenting to ED. The ED model of care is supported by aged care medical and nursing specialists who routinely review all patients over 70 years of age or any patient that has a complex aged care need. As part of the ASET model a service database was established that captured: patient clinical characteristics (age, gender) and clinical information (presenting ED information, time of arrival to the ED, discharge diagnosis and disposition).

Data analysis

Quantitative data were analysed using IBM SPSS v21™. Descriptive statistics (frequency and percentages) were used to summarise the study. Presenting ED diagnoses were grouped into categories. Categories were identified and grouped according to the ED symptom code in Firstnet based on SNOWMED [17]. Descriptive statistics were used to summarise and describe the characteristics of the sample (e.g. age, gender, time of arrival to the ED, triage code, seen by time, diagnosis and disposition from the ED). For normally distributed data, mean and standard deviations are presented. Age was considered a categorical variable. Comparison of groups was done using the Pearson Chi-squared test (gender age and triage category). For the study, statistical significance was set at $p < 0.05$.

Ethics approval

Ethical approval to undertake the study was obtained from the Human Research Ethics Committee of the Local Health District (HREC/LNR/15/HAWKE/252). Access to data was approved to analyse patient medical records and the researchers operated in accordance with the Australian National Health and Medical Research Council guidelines [18]. The ethical conduct of research was maintained during and after the research and data sources were stored in password protected files. To maintain confidentiality and privacy, patients were de-identified and re-coded on data collection. The study was conducted in accordance with the approved protocol and is reported using STROBE guidelines [19].

Results

In 2014, this ED had 37341 patient presentations which consisted of 11122 (29.7%) paediatric and 26219 (70.2%) adult patients. Of the adult population 10490 (28.1%) patients were over the age of 60 years. Patient demographics are described in Table 1. Of the 129 PD patient cases there were 260 separate ED episodes of care with the majority arriving by ambulance. The 260 episodes of care comprised 139 males (53.5%) and 121 females (46.5%). There was a statistical difference with more male presentations (Pearson's X^2 test 4.40; df 1; $p < 0.05$).

The mean time to be seen by ED staff for PD patients was 23 min (SD 26). For those patients arriving between business hours (800 and 1700 h), the mean time to be examined was 20 min (SD 21) compared to after hours, which was 30 min (SD 32). Most PD patients visited the ED on a weekday (n = 192; 73.9%). For the episodes of care most were classified as non-urgent and allocated a triage category 4 (n = 163, 62.8%) or 5 (n = 20; 7.7%) (Table 1). There was no statistical difference in triage code allocation when comparing PD patients and ED adult patients (60 years and over) (Pearson's $X2$ test 3.938 df 1 $p < 0.05$).

The most common ED Triage symptom presentation was falls (n = 118; 45.4%) (Table 2). Of the 260 episodes of ED care there was no difference in representation rate when comparing age groups, younger than 79 years with those 80 years and over. For all episodes of care there were more presentations originating from the community (n = 152; 58.5%) than aged care facilities (n = 108; 41.5%) for either age group (Table 2).

There was wide variation in length of stay when comparing aged care facilities and community dwelling residents. Patients from an aged care facility had a longer arrival to discharge time on weekends

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