



Clinical Study

Epidemiology of inpatient stay in Parkinson's disease in the United States: Insights from the Nationwide Inpatient Sample



Abhimanyu Mahajan^{a,b,*}, Poojitha Balakrishnan^{b,1}, Achint Patel^c, Ioannis Konstantinidis^d, Dominic Nistal^d, Narender Annapureddy^e, Priti Poojary^f, Girish N. Nadkarni^{c,2}, Christos Sidiropoulos^{a,2}

^a Department of Neurology, Henry Ford Health System, 2799 W. Grand Boulevard, K-11, Detroit, MI 48202, USA

^b Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA

^c Division of Nephrology, Icahn School of Medicine at Mount Sinai, New York, NY, USA

^d Department of Medicine, Icahn School of Medicine at Mount Sinai, New York, NY, USA

^e Division of Rheumatology, Vanderbilt University Medical Center, Nashville, TN, USA

^f Department of Public Health, Icahn School of Medicine at Mount Sinai, New York, NY, USA

ARTICLE INFO

Article history:

Received 26 February 2016

Accepted 8 March 2016

Keywords:

Epidemiology

Inpatient care

Outcomes research

Parkinson's disease

ABSTRACT

The total number of people living with Parkinson's disease (PD) worldwide is expected to double by 2030. The risk factors for emergency department visits in PD patients have been described before, however, there is limited data on inpatient hospitalizations of PD patients. We derived our study cohort from the Nationwide Inpatient Sample (NIS) database from 2002–2011. The NIS is a stratified 20% sample of discharges from all U.S. hospitals. We extracted causes of hospitalization using International Classification of Diseases, 9th revision, Clinical Modification (ICD-9-CM) codes and calculated inpatient mortality, length of stay and cost. Further, the significance of trends over 10 years was assessed. A total of 3,015,645 (weighted) admissions of PD patients were documented from 2002–2011. Pneumonia, urinary tract infection (UTI), septicemia and aspiration pneumonitis were the most common causes of admission, of which incidence of sepsis and UTI was trending up. Of all causes, 3.9% of the admissions resulted in inpatient mortality. Inpatient mortality for PD patients decreased from 4.9% in 2002 to 3.3% in 2011 ($p < 0.001$). The median length of stay has also steadily declined from 3.6 days in 2002 to 2.3 days in 2011. However, the inflation-adjusted cost of care has been steadily rising, from \$22,250 per hospitalization in 2002 to \$37,942 in 2011. We conclude that the epidemiology of inpatient admissions in PD has changed significantly over the last decade. Our study underscores the need for future, in-depth prospective studies to explore this changing disease spectrum to design preventive measures and targeted interventions.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

An estimated 1 million Americans have Parkinson's disease (PD) with 60,000 new cases diagnosed each year. The total number of people living with PD worldwide is 7–10 million and prevalence above the age of 50 is expected to double by 2030 [1]. With an increase in the number of PD patients, there is a growing burden of management on physicians, caregivers and health systems at large.

While the management of PD is largely on an outpatient basis, patients with PD are admitted to the hospital due to various comorbidities. The risk factors for emergency room visits and

hospitalizations in PD patients have been described before [2]. Although there is data about inpatient hospitalizations from National Parkinson Foundation (NPF) centers, there is limited data pertaining to national trends in inpatient hospitalizations of PD patients. This is important since PD patients could get hospitalized in a variety of hospitals including rural, community and non-teaching hospitals.

Using a large, nationally representative database, we explored the epidemiology of inpatient hospitalizations of PD patients. We also sought to assess temporal trends in hospitalization characteristics from 2002 to 2011.

2. Methods

We derived the study cohort from the Nationwide Inpatient Sample (NIS) database from 2002–2011. The NIS is the largest

* Corresponding author. Tel.: +1 4436836552; fax: +1 2128492643.

E-mail address: amahaja1@hfhs.org (A. Mahajan).

¹ These authors have contributed equally to the manuscript.

² These authors have contributed equally to the manuscript.

publicly available all-payer inpatient care database in the United States, including data on approximately 7 to 8 million discharges per year, and is a stratified 20% sample of discharges from U.S. hospitals, excluding rehabilitation and long-term acute care hospitals. National estimates are produced using sampling weights provided by the Healthcare Cost and Utilization Project (HCUP) [3]. We queried the NIS database between 2002 and 2011 using the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) diagnosis code 332.xx for PD as a primary or secondary diagnosis. This code has a specificity of 99% and a positive predictive value of 81%, albeit not from the same administrative database [4].

We extracted admission diagnosis using ICD-9-CM codes. We also extracted inpatient mortality, length of stay, adverse discharges (described as discharge to a higher level of care compared to that at admission) and costs of hospitalization. We categorized race as white, black and other (Hispanic, Asian or Pacific Islander and Native American); payer status as State-provided insurance (Medicare and Medicaid), private insurance and self-pay for those without insurance, and utilized a quartile classification of estimated median household income using patient zip codes and categorized hospital bed size as small, medium, large. We also defined location and teaching status of hospitals (rural, urban non-teaching, urban teaching). Teaching hospitals were those that had an American Medical Association-approved residency program or were a member of the Council of Teaching Hospitals. We assessed length of stay and hospital cost in patients who did not die during their stay and used diagnosis classification system

(DXCCS) codes to assess primary diagnoses when the secondary diagnosis was PD. We assessed trends in incidence of the top 10 most common primary diagnoses documented with the secondary diagnosis from 2002 to 2011.

In order to calculate the estimated cost of hospitalization, we merged the NIS with cost-to-charge ratios available from the HCUP. To account for inflation we used the Bureau of Labor Statistics consumer price index calculator and converted all cost to their dollar value in 2015. This study used the NIS, a de-identified patient database. Therefore, this study did not require institutional review board review, in accordance with the Code of Federal Regulations, 45 CFR 46.

We used Student's t-test, chi-squared test and Wilcoxon rank sum tests for baseline analysis and Cochran Armitage trend test for trend analyses. We utilized SAS version 9.4 (SAS Institute Inc., Cary, NC, USA) for all analyses.

3. Results

3.1. Epidemiology of hospitalization in PD patients admitted with any diagnosis

A total of 3,015,645 hospitalizations with PD were documented from 2002–2011. The mean age on admission was 78 years with 53.2% of all hospitalizations being male. Approximately, 66% of hospitalizations were white, with 5% being Black or Hispanic, each. With respect to hospital size classification, 59.9% of hospitalizations were to large hospitals and 14.9% were to small hospitals.

Table 1
Baseline characteristics of all hospitalized patients with Parkinson's disease using the Nationwide Inpatient Sample database from 2002 to 2011

Baseline Characteristics	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Overall	p-value
Age (Median years)	79 (73–84)	79 (73–84)	78 (72–84)	79 (72–83)	78 (72–83)	78 (71–83)	78 (71–83)	78 (71–83)	78 (71–83)	78 (71–83)	78 (72–84)	<0.001*
Age												<0.001*
18–44	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
45–64	7.4	7.9	8.7	8.8	9.5	10.1	9.9	10.9	11.3	11.6	9.6	
≥65	92.1	91.5	90.7	90.7	89.9	89.3	89.5	88.5	88.2	87.9	89.9	
Sex												<0.001*
Male	52.3	52.2	52.7	52.6	52.6	53.5	53.5	53.9	54.5	54.6	53.2	
Female	47.6	47.8	47.2	47.4	47.3	46.5	46.5	46.0	45.4	45.4	46.7	
Race												<0.001*
White	61.6	61.2	62.3	64.3	62.8	60.6	67.3	71.4	72.9	74.8	65.9	
Black	4.6	4.8	5.5	3.8	5.0	4.9	4.6	5.1	5.9	6.3	5.1	
Hispanic	4.1	6.3	4.6	4.9	6.1	5.3	5.2	5.9	5.9	6.1	5.5	
Others	2.9	3.2	3.2	3.1	3.3	3.9	4.4	4.9	4.4	4.1	3.7	
Missing	26.7	24.5	24.4	23.8	22.7	25.3	18.5	12.6	10.9	8.6	19.8	
Hospital size												<0.001*
Small	13.8	13.7	15.1	14.2	16.5	15.0	14.7	13.9	16.2	15.3	14.8	
Medium	24.4	26.9	26.3	24.7	24.9	25.2	24.4	23.7	23.1	24.1	24.8	
Large	61.8	59.3	58.5	61.0	58.3	59.6	60.7	60.8	59.7	59.7	59.9	
Hospital Teaching status												<0.001*
Non-teaching	62.7	62.6	63.3	67.0	60.9	61.8	62.0	60.4	61.9	58.3	62.1	
Teaching	37.2	37.4	36.6	32.9	38.9	37.9	37.8	38.1	37.1	40.8	37.9	
Hospital location												<0.001*
Rural	17.7	16.7	15.4	15.8	15.8	16.7	16.2	15.0	16.4	13.9	16.0	
Urban	82.2	83.2	84.6	84.1	83.9	83.0	83.6	83.4	82.5	85.2	83.6	
Hospital region												<0.001*
Northeast	21.4	23.4	22.7	23.5	21.6	20.6	20.9	19.9	20.5	22.3	21.7	
Midwest or North Central	24.4	24.2	24.7	25.5	24.2	25.0	24.2	25.0	24.6	25.5	24.7	
South	35.3	35.7	36.8	33.5	35.4	34.7	35.95	35.2	35.12	34.3	35.2	
West	17.6	15.4	15.7	17.5	17.1	17.9	17.3	18.2	18.1	16.4	17.1	
Primary payer												<0.001*
Medicare/Medicaid	90.7	91.6	89.9	91.6	91.1	89.7	88.8	89.0	89.3	89.7	90.2	
Private including HMO	7.9	7.0	8.3	6.9	7.3	8.5	9.2	8.9	8.8	8.4	8.1	
Self pay/no charge/other	1.2	1.2	1.7	1.4	1.4	1.7	1.8	1.8	1.8	1.6	1.6	
Outcomes												<0.001*
Home	34.6	35.7	32.7	32.2	32.7	32.6	32.1	31.8	30.4	30.5	32.6	
Facility	59.7	58.5	62.5	63.3	63.1	63.4	63.8	64.0	65.6	65.6	62.9	
Death	4.9	4.6	4.3	3.9	3.7	3.6	3.4	3.7	3.4	3.3	3.9	

* p < 0.05 was considered statistically significant.
HMO = Health Maintenance Organization.

Download English Version:

<https://daneshyari.com/en/article/3058106>

Download Persian Version:

<https://daneshyari.com/article/3058106>

[Daneshyari.com](https://daneshyari.com)