

Associated With Emergency Department Visits Among Patients With a Diagnosis of Restless Legs Syndrome

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BACKGROUND

- Restless legs syndrome (RLS) affects between 2% and 15% of the population and is characterized by unpleasant sensations in the legs and an urge to move them for relief.^{1,2}
- Previous studies have estimated the annual overall economic burden of RLS to be approximately \$7,600.³
- Additionally, it has been estimated that patients with RLS experience a 30% impairment in work productivity, and this impairment tends to increase with increasing severity.⁴

OBJECTIVE

- This study evaluated the demographics and charges associated with emergency department (ED) visits among patients with RLS.
 - The results of this study are generalizable to the United States (US) population.

METHODS

Data Source – the Healthcare Cost and Utilization Project’s 2007 Nationwide Emergency Department Sample (NEDS)

- NEDS is a US-based, nationally-representative, all-payer ED database.
- The database contains almost 26 million (unweighted) records, representing over 122 million weighted encounters for ED visits in more than 950 hospitals.
 - Observations are at the visit level.
 - Patients with ED visits that result in hospitalization are also included in the database.
- NEDS contains information on patient characteristics, facility characteristics, and the reason for the visit.
- ED charge information is available for approximately 75% of patients, regardless of payer.

Inclusion Criterion

- Patients were selected for inclusion if they had a primary or secondary diagnosis of RLS (International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9-CM] code 333.94).

Outcome Measures

- The study examined the following outcome measures:
 - Patient demographics (age, sex, primary expected payer)
 - Facility characteristics (facility type, region, location, teaching status)
 - Discharge characteristics (disposition, mortality, type of visit, self-harm)
 - Charges.
- Among patients with a secondary RLS diagnosis, the 10 most common primary diagnoses using the first three digits of the ICD-9-CM code were reported.

Data Analyses

- All results were reported separately for patients with a primary versus secondary RLS diagnosis.
- Descriptive statistics of all study measures were reported by cohort.
- Sample weights were used to generalize results to the entire US population.
- All analyses were conducted using SAS version 9.1.

RESULTS

- A total of 6,133 patients were identified with a primary RLS diagnosis, and 140,932 patients were identified with a secondary RLS diagnosis (Table 1).
- Patients with a secondary diagnosis of RLS were on average 10 years older than patients with a primary RLS diagnosis.
- In both cohorts, over two-thirds of patients were female and Medicare was the most common primary expected payer (Table 1).
- In both cohorts, most patients were treated in government or private nonteaching facilities, located in the South or Midwest (Table 2).
- Among patients with a primary RLS diagnosis, over 90% had a routine discharge disposition (i.e., they were treated and released); among patients with a secondary RLS diagnosis, over 70% were admitted to the hospital as an inpatient (Table 3).
- Mean charges were \$816.39 (standard error [SE]: \$48.07) among patients with a primary RLS diagnosis and \$2,043.05 (SE: \$61.70) among patients with a secondary RLS diagnosis.
- The most common primary diagnoses among patients with a secondary diagnosis of RLS were respiratory or chest symptoms (7.02%), general symptoms (4.61%), and pneumonia (3.68%) (Table 4).

Table 1. Patient Demographics, by RLS Diagnosis

Characteristic	RLS Diagnosis			
	Primary N = 6,133		Secondary N = 140,932	
	n	%	n	%
Age (years)				
< 18	9	0.15	84	0.06
12-17	21	0.34	241	0.17
18-44	1,828	29.81	20,243	14.36
45-64	2,583	42.11	48,231	34.22
65+	1,692	27.59	72,128	51.18
Missing	—	—	4	0
Mean (SE)	54.52	(0.56)	63.95	(0.26)
Sex				
Male	1,738	28.34	42,934	30.46
Female	4,385	71.49	97,967	69.51
Missing	10	0.16	31	0.02
Expected primary payer				
Medicare	2,514	41.00	83,567	59.30
Medicaid	1,090	17.77	12,212	8.66
Private, including HMO	1,525	24.87	35,226	25.00
Self-pay	814	13.28	5,943	4.22
Other/missing	189	3.08	3,985	2.83

HMO = health maintenance organization.

Table 2. Facility Characteristics, by RLS Diagnosis

Characteristic	RLS Diagnosis			
	Primary		Secondary	
	n	%	n	%
Facility type				
Government or private	3,052	49.76	90,620	64.30
Government, nonfederal, public	683	11.14	8,468	6.01
Private, nonprofit, voluntary	1,089	17.76	21,991	15.60
Private, invest-own	656	10.69	11,747	8.34
Private, collapsed category	653	10.65	8,106	5.75
Facility region				
Northeast	733	11.96	17,425	12.36
Midwest	1,751	28.55	51,917	36.84
South	2,596	42.32	54,020	38.33
West	1,053	17.17	17,569	12.47
Facility urban-rural location				
Metropolitan area	4,142	67.53	115,024	81.61
Nonmetropolitan	1,991	32.46	25,908	18.38
Facility teaching status				
Metropolitan nonteaching	2,773	45.22	67,326	47.77
Metropolitan teaching	1,369	22.32	47,698	33.85
Nonmetropolitan	1,991	32.46	25,908	18.38

Table 3. Discharge Characteristics, by RLS Diagnosis

Characteristic	RLS Diagnosis			
	Primary		Secondary	
	n	%	n	%
Discharge disposition				
Routine	5,600	91.31	37,440	26.57
Admitted as an inpatient to this hospital	279	4.55	99,688	70.73
Other	255	4.15	3,804	2.71
Died				
Did not die	5,995	97.75	138,333	98.16
Died	0	---	1,349	0.96
Missing	138	2.25	1,250	0.89
Type of ED event				
ED visit in which patient is treated and released	5,674	92.52	38,924	27.62
ED visit in which the patient is admitted to this hospital	279	4.55	99,688	70.73
Other	180	2.94	2,320	1.65
Diagnosis reported on records indicates self-harm				
No intended self-harm	6,130	99.95	138,584	98.33
Intended self-harm	3	0.05	2,348	1.67

Table 4. Common Primary Diagnoses Among Patients With a Secondary RLS Diagnosis

ICD-9-CM Code	Description	n	%
786	Symptoms involving respiratory system and other chest symptoms	9,886	7.02
780	General symptoms	6,498	4.61
486	Pneumonia, organism unspecified	5,186	3.68
491	Chronic bronchitis	5,011	3.56
428	Heart failure	4,948	3.51
427	Cardiac dysrhythmias	3,469	2.46
276	Disorders of fluid, electrolyte, and acid-base balance	2,788	1.98
296	Episodic mood disorders	2,783	1.97
789	Other symptoms involving abdomen and pelvis	2,747	1.95
599	Other disorders of urethra and urinary tract	2,534	1.80
414	Other forms of chronic ischemic heart disease	2,484	1.76

LIMITATIONS

- Physician charts were not available to confirm RLS.
 - ED visits were identified based upon diagnosis codes, which if recorded incorrectly, may cause misidentification of patients and events of interest.

CONCLUSIONS

- Most patients with a primary RLS diagnosis did not have a subsequent inpatient stay.
- This nationally representative study suggests that patients admitted to the ED with RLS accrue substantial charges during their visit.
- Patients with a secondary RLS diagnosis were commonly admitted for respiratory symptoms.
- Further research is needed to more fully assess the total economic burden of the disease.

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