Emergency Department Visits for PSVT:







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Background

- Paroxysmal supraventricular tachycardia (PSVT) is an arrhythmia that may be challenging to diagnose due to its sudden onset and episodic nature.
- PSVT prevalence in the US was estimated to be as high as 2.1 million patients, with an annual incidence of nearly 300,000, based on projections to the 2018 census^{1,}
- Studies of incident PSVT patients have found substantial increases in rates of Emergency Department (ED) visits, inpatient admissions (IP), physician office visits (OV), and outpatient hospital (OH) visits following diagnosis^{2,3}.
- Data on healthcare resource utilization (HRU) among prevalent PSVT patients in the United States (US) is limited.

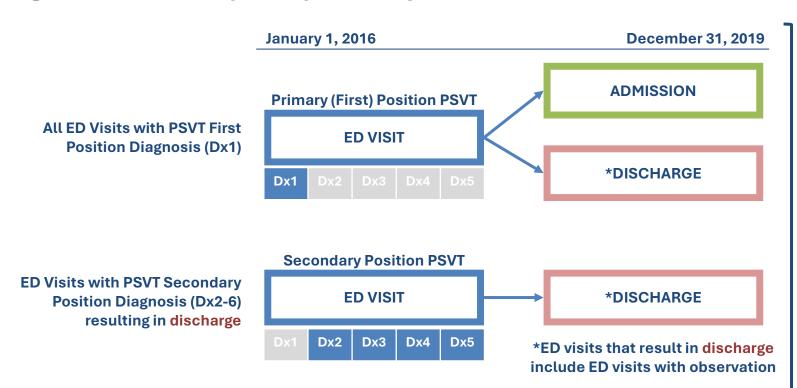
Objective

• Quantify and examine temporal trends in ED visits for PSVT among US adults aged 18 years and older from 2016-2019, the most recent pre-COVID year.

Methods

- This serial retrospective, cross-sectional analysis of ED visits in the US used the Agency for Healthcare Research and Quality's (AHRQ) Healthcare Cost and Utilization Project (HCUP)'s Nationwide Emergency Department Sample (NEDS) database (2016-2019).
- All ED visits for adults age ≥18y with a primary (first) position diagnosis of PSVT (International Classification of Diseases Tenth Revision, Clinical Modification [ICD-10-CM]: I47.1) between January 1, 2016, and December 31, 2019, were included.
- ED visits were identified overall and stratified by the presence or absence of comorbid atrial fibrillation (AFib)/atrial flutter (AFI) (ICD-10-CM: I48.0, I48.1x, I48.2x, I48.3, I48.4, I48.9x).
- Sampling weight files provided by AHRQ were used to generate national annual ED visit estimates.
- Sensitivity analyses that included ED visits with a PSVT diagnosis in a primary or secondary position if the patient was discharged, as well as ED visits with a primary position PSVT diagnosis that resulted in hospital admission, were conducted to reflect reimbursement differences for ED visits resulting in discharge vs. admission (Expanded PSVT ED Visit Definition) (Figure 1).
- Demographic characteristics were examined and annual ED visit rates per 10,000 US population calculated using counts from the Surveillance, Epidemiology, and End Results (SEER) program.
- Poisson regression, based on 2016-2019 visit increases, was used to project estimates of PSVT visits through 2030. All analyses were conducted in SAS (Version 9.4).

Figure 1. Sensitivity Analyses: Expanded PSVT ED Visit Definition



Expanded PSVT ED Definition Primary PSVT Admitted plus Any Position PSVT Treated and Discharged

Results

Table 1. ED Visits among adults age 18+ in the US with PSVT as Primary Diagnosis with or without Secondary Atrial Fibrillation/Atrial Flutter and Sensitivity Analysis Definition, NEDS 2019

	ED Visits with Primary Diagnosis of PSVT	Expanded PSVT ED Visit Definition
Number of PSVT ED visits (95% CI), % of total ED visits	139,992 (132,913, 147,070), 0.119	259,916 (243,277, 276,554), 0.221
Rate per 10,000 (95% CI)	5.46 (5.18, 5.73)	10.13 (9.48, 10.78)
Admitted to same hospital, N (%)	33,835 (24.2)	33,835 (13.0)
Observation, N (% of treated and Discharged from ED)	14,113 (10.1)	45,075 (19.9)
Mean age (95% CI), year	57.8 (57.4,58.1)	58.0 (57.6, 58.4)
Age group, N (%)		
18-64	87,686 (62.6)	157,785 (60.7)
65 and over	52,305 (37.4)	102,130 (39.3)
Female (%)	83,035 (59.3)	161,258 (62.0)
Payer, N (%)		
Medicare	53,028 (37.9)	106,844 (41.1)
Medicaid	17,349 (12.4)	36,187 (13.9)
Commercial	55,110 (39.4)	91,900 (35.4)
Region of hospital, N (%)		
Northeast	24,120 (17.2)	38,123 (14.7)
Midwest	33,417 (23.9)	69,341 (26.7)
South	51,913 (37.1)	94,332 (36.3)
West	30,542 (21.8)	58,120 (22.4)

- The majority of PSVT ED visits were for adults aged < 65 years (62.6%), with a mean age of 57.8 years (Table 1)
- Sensitivity analyses using an expanded PSVT ED visit definition identified a total of 259,916 (95% CI: 243,277, 276,554) PSVT ED visits in 2019 (**Table 1**).
- Demographic characteristics from the expanded PSVT ED visit definition were similar to those identified using the primary definition (Table 1)

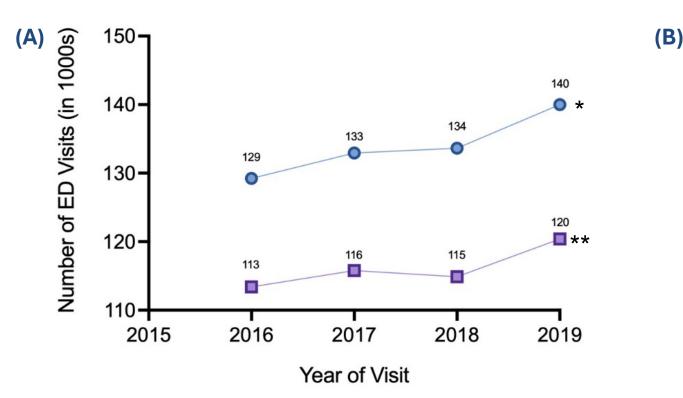
Discussion

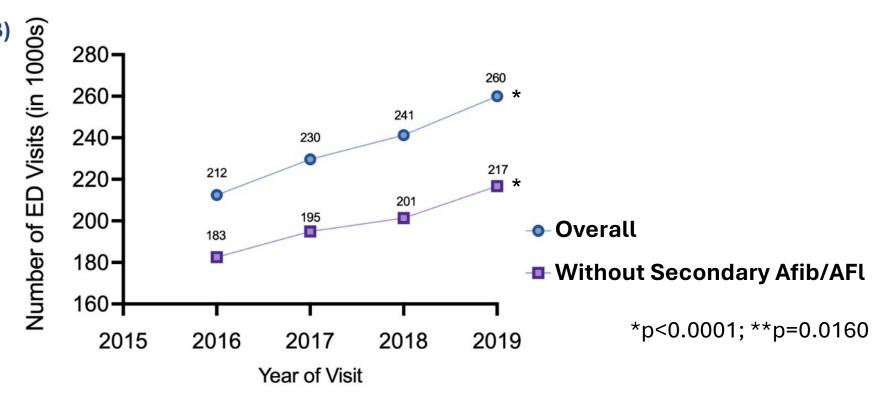
- In 2019, the most recent pre-COVID data year, there were an estimated 140,000 ED visits with a primary position PSVT diagnosis and a total of 260,000 ED visits when all ED visits, regardless of PSVT diagnosis position, were included
- A majority of PSVT ED visits were for women and for individuals under age 65, and most did not include an AFib or AFI diagnosis.
- PSVT ED visits and visit rates per 10,000 population increased significantly from 2016 through 2019, suggesting that increases do not reflect population changes alone.

Limitations

- Given the challenges in PSVT diagnosis, some episodes may have resolved before ED treatment. Consequently, it is possible that the "true" number of ED visits for acute PSVT is higher than these estimates.
- The study omits COVID-era data, limiting projections to be based on pre-pandemic trends.

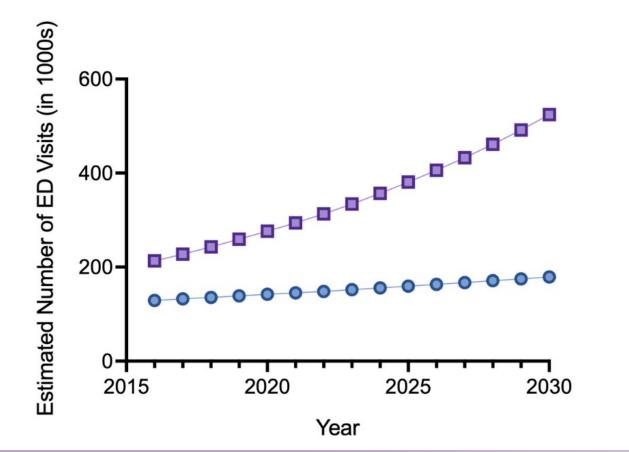
Figure 2. Trends in ED Visits among Adults age 18+ in the US with PSVT based on (A) Primary Diagnosis, (B) Expanded PSVT Definition, NEDS 2016-2019





- ED visits with PSVT as the primary diagnosis significantly increased 8.3% from 2016-2019; 129,219 to 139,992 (p<0.0001) (Figure 2A).
- Most PSVT ED visits (86.0%) did not have a secondary diagnosis of AFib or AFI; 120,377 of 139,992 (Figure 2A).
- PSVT ED visits without a secondary AFib or AFI diagnosis increased 6.2% (p=0.0160) whereas PSVT ED visits with a secondary diagnosis of AFib or AFI, a considerably smaller proportion of all PSVT ED visits, increased 24.0% (p<0.0001) (Figure 2A).
- Using the expanded definition, PSVT ED visits significantly increased 22.4% over the study period (from 212,374 in 2016 to 259,916 in 2019, p<0.0001), a more rapid increase compared with PSVT ED visits defined using only the primary diagnosis (Figure 2B)

Figure 3. Projected Estimates of ED visits among Adults age 18+ in the United States NEDS, 2016-2030



- ED Visits with Primary Diagnosis of PSVT
- Expanded PSVT ED Visit Definition
- Poisson regression based on 2016-2019 trends estimated ED visits with PSVT as the primary diagnosis to be 179,000 by 2030 (Figure 3).
- Projected ED visit estimates were much greater using the expanded definition, reflecting higher rates of increase from 2016-2019, with estimates of 524,160 PSVT ED visits by 2030.

Conclusions

- ED visits for PSVT significantly increased among US adults from 2016 to 2019.
- The rising projected rates of PSVT-related ED visits underscore the need to reduce the burden on patients, providers, and payers, highlighting the importance of studying outpatient interventions that may help avoid emergency care.

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