Healthcare Resource Utilization (HRU) Among Patients with Paroxysmal Supraventricular Tachycardia (PSVT)

Nihar R. Desai[1], Naomi C. Sacks[2], Richard L. Sherwood[3], David B. Bharucha[3], Sean D. Pokorney[4]

[1]Yale University, New Haven, CT, USA; [2]HEORStrategies, Boston, MA; [3]Milestone Pharmaceuticals, Charlotte, NC, USA; [4]Duke University, Durham, NC, USA

Background

- Paroxysmal supraventricular tachycardia (PSVT), a common arrythmia characterized by episodic tachycardia, is associated with substantial healthcare resource utilization (HRU) among newly diagnosed PSVT patients in the United States.[1,2]
- Previous studies highlight the heterogeneity in coding for confirmed PSVT, which can be challenging to diagnose and coded as a related arrythmia.[3,4]
- Prior studies have relied on the ICD-9 PSVT diagnosis code, which is narrower than the ICD-10 PSVT diagnosis code introduced October 1, 2015.
- HRU and costs for PSVT using the more comprehensive ICD-10 PSVT diagnosis code are unexamined.

Objectives

- Characterize healthcare resource use and costs for PSVT in the United States using the more comprehensive ICD-10 diagnosis code.
  - Characterize trends in emergency department (ED) visits and inpatient (IP) admissions for PSVT in the United States from 2016-2019.
  - Examine HRU and expenditures among prevalent PSVT patients relative to a matched non-PSVT comparator population in 2019.

Methods

- We used Agency for Healthcare Research and Quality's (AHRQ) Healthcare Cost and Utilization Project (HCUP)'s Nationwide Emergency Department Sample (NEDS) database and National Inpatient Sample (NIS) (2016-2019) to examine trends in ED visits and inpatient admissions for adults (≥18y) with a principal or secondary ICD-10 diagnosis of PSVT (ICD-10: I47.1).
- Due to the broad range in PSVT diagnoses resulting from primary, secondary, and tertiary coding differences, we conducted a matched control analyses to estimate the burden of PSVT.
- IQVIA's PharMetrics® adjudicated claims database was used to characterize HRU and costs in prevalent PSVT patients compared to a matched comparator patient cohort.
  - PSVT study patients met these study inclusion criteria:
    - Continuously enrolled in their health plan prior to and during 2019;
    - 1+ IP admission or ED visit or 2+ outpatient visits with a PSVT diagnosis (ICD-10: I47.1) in 2019;
    - 1+ visit with a cardiologist or 1+ visit for PSVT with a PCP in the 3 years (2016-2019) before their first diagnosis in 2019.
  - PSVT patients were matched by age, gender, payer, and Charlson Comorbidity Index (CCI) score to comparator patients with no evidence of PSVT.
- Healthcare resource use and costs were measured and compared between PSVT and comparator patients:
  - Percentages of PSVT and comparator patients with at least one ED visit, IP admission, OV or OH visit in 2019 were calculated, as were the mean number of these encounters among those with at least one of each type of encounter
  - Costs paid by by payers and patient out-of-pocket payments were calculated, as was IP length of stay (LOS)
  - We used standard t-tests to estimate the significance of differences in HRU between PSVT and comparator patients.

References

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Results

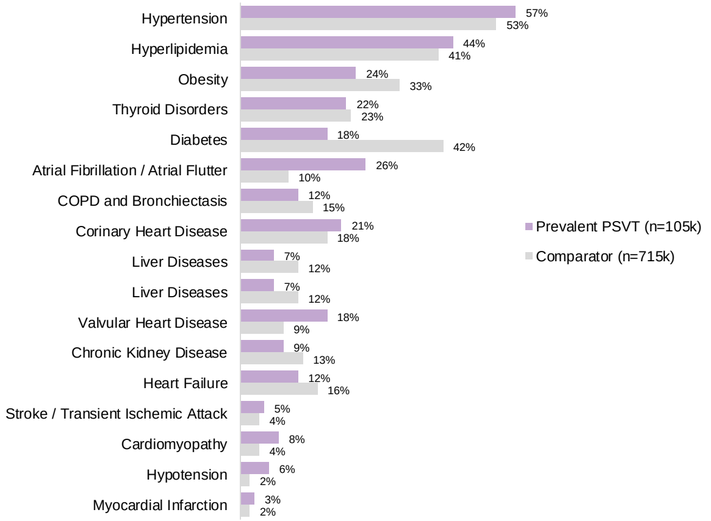
- Number of ED Visits and IP admissions in 2019 are displayed in Table 1.
- ED visits with a principal diagnosis of PSVT increased 8% over our study period, from 129,219 in 2016 to 139,992 in 2019 (p=0.0415); ED visits with a secondary diagnosis of PSVT increased 36%, from 285,138 in 2016 to 386,454 in 2019.
- IP admissions with a principal PSVT diagnosis increased 4% from 38,630 in 2016 to 40,355 in 2019 (p=0.0415); IP admissions with a secondary PSVT diagnosis increased 34% from 291,675 in 2016 to 351,485 in 2019.
- Approximately 1 in 4 ED visits with a principal position PSVT diagnosis and 7 in 10 ED visits with a secondary position PSVT led to admission to the same hospital.

Table 1. ED Visits and IP Admissions for Dx1, Dx2+3, and Dx4+ PSVT (HCUP, 2019)

Diagnosis (Dx) Position	ED Visits	IP Admissions
Dx1	139,992	40,355
Dx2+Dx3	124,435	107,910
Other	262,019	243,575
Total	526,446	391,840

- Analyses of 105,000 prevalent PSVT and 715,000 matched non-PSVT patients identified cohorts that were similar in gender (39% were male, 61% female in both cohorts), age distribution (0-18: 2%; 18-44: 18%; 45-64: 53%; 65-84: 21-22%; 85+ 6%), payer type (commercial 81-82%; Medicare: 18%), and CCI.
- Top comorbidities in the cohorts are displayed in Figure 1.

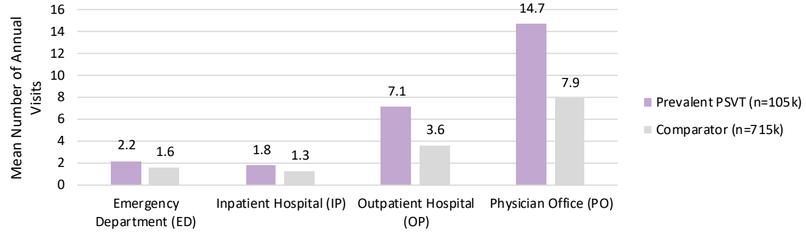
Figure 1. Top Comorbidities in 2019 in Prevalent PSVT and Comparator Cohorts (IQVIA PharMetrics, 2019)



Results (cont.)

- In the year following PSVT diagnosis, mean annual per patient payer expenditures were higher for all PSVT vs. comparator patients ($21,282 vs. $4,889).
- Out-of-pocket expenditures for PSVT patients were also higher ($1,782 vs. comparator patients: $785).
- IP admissions were also longer for PSVT patients, with an average length of stay of 7.8 days (vs. comparator patients: 5.7 days).
- Greater proportion of PSVT patients had at least one ED visit (29% vs 11%), one IP admission (20% vs 4%), one office (OV) visit (95% vs 90%), or one outpatient hospital (OV) visit (78% vs 50%) compared to the matched comparator cohort (all p<0.0001).
- Mean annual per patient visit rates among those with at least one visit were also substantially higher for PSVT than non-PSVT (Figure 2).

Figure 2. Mean Number of Annual Visits of Prevalent PSVT and Comparator Patients with at least one Annual All-Cause Healthcare Visit, IQVIA PharMetrics 2019



Discussion

- ED visits and IP admissions with a PSVT diagnosis increased significantly over our study period, with approximately 140,000 ED visits and 40,000 hospitalizations with principal position PSVT diagnosis in 2019.
- PSVT may also underlie ED visits and IP admissions with a secondary PSVT diagnosis.
- Patients with PSVT had higher HRU and expenditures, compared with non-PSVT patients, in all settings of care.
- Previous analyses of ICD-9 data showed lower estimates of ED visits and IP admissions in the US.
- Our study data sources do not contain clinical confirmation of PSVT diagnosis. However, our definitions of prevalent PSVT patients required both HRU and PCP/specialist visits.
- It is possible that the HRU and cost burden of PSVT was underestimated in this analysis, given our prevalent PSVT definition and the challenges in PSVT diagnosis.
- Matching based on CCI score resulted in disproportionate comorbidity profiles when comparing cohorts which may have an impact on the difference seen in HRU.
- Nonetheless, this study provides valuable insights into the true burden of PSVT and expands on the existing literature.
- Additional analysis will be conducted to explore HRU in a PSVT population matched on demographic characteristics and comorbidities.

Conclusions

- ED visits and inpatient admissions for PSVT have increased significantly in the US.
- Compared with non-PSVT patients, prevalent PSVT patients have higher rates of healthcare resource utilization and higher costs in all settings of care, with the greatest differences in more costly inpatient and ED settings.
- Treatments and initiatives to manage PSVT in the outpatient setting, and avoid costly ED visits and inpatient admissions, are needed to minimize the impact of PSVT on HRU and payer and patient expenditures.