Hospitalization rate of paroxysmal supraventricular tachycardia in Sweden

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ABSTRACT

Introduction: The hospitalization rate of paroxysmal supraventricular tachycardia (PSVT) in a nationwide study is not established. We determined age- and sex-specific hospitalization rates and time trends for hospitalized PSVT in the Swedish population between 1987 and 2010.

Methods: This nationwide study is based on the Swedish Hospital Discharge Register. The patients with first PSVT diagnoses between January 1987 and December 2010 were identified.

Results: A total of 42,765 individuals with PSVT were diagnosed (mean age 60 years; 44% males). The overall age- and sex-adjusted hospitalization rate was 20 per 100,000 person-years. The hospitalization rate increased with advancing age with highest hospitalization rates in individuals aged 80–84 years (67.12 per 100,000 person-years) and did not change significantly over time. A total of 20,011 (46.8%) patients had "lone" PSVT without any comorbidities. Lone PSVT patients were younger than PSVT patients with comorbidities (mean age 54 vs. 67 years, \( p = .0002 \)).

Conclusions: This study showed a slight preponderance for females and stable hospitalization rate of PSVT over time; the hospitalization rate increased with age. A high proportion of PSVT patients had no comorbidities. They were affected at a younger age than patients with comorbidities, which suggests an inherent predisposition.

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KEY MESSAGES

• This study represents the first extensive and nationwide hospitalization study of PSVT. Hospitalization is highest in old age but a bimodal pattern was observed with a small peak in the first years of life. Patients with lone PSVT are younger than those with comorbidities; which suggests an inherent predisposition.

Abbreviations: PSVT: Paroxysmal supraventricular tachycardia; SIR: Standardized incidence ratio; ICD: International Classification of Diseases; CHD: Coronary heart disease; CI: Confidence interval; MESA: Marshfield Epidemiologic Study Area; AF: Atrial fibrillation

Introduction

Paroxysmal supraventricular tachycardia (PSVT) is a relatively common arrhythmia that is frequently encountered in the emergency room setting [1]. PSVTs are rapid and are usually regular rhythms. The most common types are atrial tachycardias, atioventricular nodal reentrant tachycardias and tachycardias mediated by an accessory pathway [2]. Its occurrence is sporadic and unpredictable [3,4]. Symptoms vary, the most common being dyspnea, tachycardia, nausea, hypotension, hyperhidrosis, syncope and aborted sudden death [3–9]. Nevertheless, PSVT has generally been considered to be a benign illness. Previous studies have, however, shown a link between PSVT and higher incidence of atrial fibrillation, and an increased risk of thromboembolic events in patients with PSVT [10–13]. An association between sustained supraventricular tachycardias and cardiomyopathic changes has been previously observed [14,15]. In spite of this, there is a paucity of large nationwide population-based data describing the incidence of PSVT. A small hospital-based study (33 cases) that examined the incidence and descriptive epidemiology of PSVT was published in 1998 [16]. There are some studies published regarding the prevalence, incidence and epidemiology of PSVT in infancy and adolescence [17–22]. However, the epidemiology of PSVT in the general population is unknown, which calls for population-based studies to assess the clinical burden of PSVT and to describe its demographics.

We determined the hospitalization rate of PSVT in the general Swedish population by using the Swedish Hospital Discharge Register. The patients with first PSVT diagnoses between January 1987 and December 2010 were identified. A total of 42,765 individuals with PSVT were diagnosed (mean age 60 years; 44% males). The overall age- and sex-adjusted hospitalization rate was 20 per 100,000 person-years. The hospitalization rate increased with advancing age with highest hospitalization rates in individuals aged 80–84 years (67.12 per 100,000 person-years) and did not change significantly over time. A total of 20,011 (46.8%) patients had "lone" PSVT without any comorbidities. Lone PSVT patients were younger than PSVT patients with comorbidities (mean age 54 vs. 67 years, \( p = .0002 \)).

Conclusions: This study showed a slight preponderance for females and stable hospitalization rate of PSVT over time; the hospitalization rate increased with age. A high proportion of PSVT patients had no comorbidities. They were affected at a younger age than patients with comorbidities, which suggests an inherent predisposition.
Hospital Discharge register. This study represents the first extensive and nationwide hospitalization study of PSVT.

**Material and methods**

This study was approved by the Ethics Committee of Lund University, Sweden and complies with the recommendations of the Declaration of Helsinki.

**National registries**

The dataset used for this article was constructed using data from the Swedish Hospital Discharge Registry and was linked to the total population register [23–25]. The Swedish Hospital Discharge Registry was started in 1964 and attained full nationwide coverage in 1987. It contains all hospital admission data in Sweden between 1987 and 2010. The national registration number (a 10-digit number), which is unique for each Swedish resident, is recorded at each hospital admission together with information on main and contributory diagnoses based on the International Classification of Diseases (ICD-9 1987–1996 and ICD-10 1997-2010). At present, more than 99% of hospital discharges are registered [23–25]. The primary diagnosis is the main condition that the patient required hospitalization and treatment for and is ascertained by the senior physician (consultant) at discharge. The additional (secondary or contributory diagnoses) are co-morbidities and/or complications that the patient was treated for. Between 1964 and 1996 up to six diagnoses were recorded for each visit. From 1997 onwards up to eight diagnoses were recorded.

The validity of the data in the Swedish Hospital Discharge Registry is high [23–28]. The Swedish Hospital Discharge has approximately 85–95% overall validity for most diagnoses. Validity for specific related cardiovascular disorders such as atrial fibrillation, myocardial infarction and stroke is even higher (90–95%) [23–28].

**Study population**

Our study population was the entire population of Sweden. PSVT was defined according to its corresponding international classification of disease (ICD) code: ICD-9 (427A) and ICD-10 (I471). The ICD-10 code I471 denotes atrioventricular, atrial, junctional and nodal PSVT. ICD-9 code 427A denotes PSVT without any further subtypes. All the patients admitted to a Swedish hospital between 1987 and 2010 are included in the study. First event of hospital diagnosed PSVT was recorded. Patients with either PSVT as a primary diagnosis or as a secondary diagnosis were considered to have PSVT. There are up to a total of eight different diagnoses recorded for each hospital visit, where the first diagnosis is the main diagnosis and the seven additional diagnoses are the secondary diagnosis. For the correct estimation of incident cases, a washout was performed that excluded patients with a PSVT diagnosis between 1984 and 1986 (ICD-8 code 427,90).

**Comorbidities**

Comorbidities were defined by occurring in the same hospitalization as first event of PSVT. The following ICD codes were used to define the most common comorbidities. Coronary heart disease (CHD) ICD-10 I20-I25, ICD-9 410-414; Hypertension ICD-10 I10-I15, ICD-9 401-405; Diabetes ICD-10 E10-E14, ICD-9 250; Atrial Fibrillation ICD-10 I48, ICD-9 427D; Heart Failure ICD-10: I50, ICD-9 428; Valvular heart disease ICD-10: I05-I08, I34-I37, ICD-9: 394-396 & 424; Congenital heart disease ICD-10: Q20-Q26, ICD-9: 745-747; Stroke: I61-I64, ICD-9 431-434; Cardiomyopathy ICD-10: I42 I43, ICD-9: 425; Hyperthyroidism ICD-10 E05, ICD-9 242; Pulmonary disease ICD-10: J40-J45, ICD-9: 490-494; and Chronic kidney diseases ICD-10: N18,N19, ICD-9: 585-586.

**Regional hospitalization rates**

The 1990 Swedish Population Census with information on region of residency was used to determine regional hospitalization rates for northern Sweden (the four most northern counties Västernorrland, Jämtland, Västerbotten, and Norrbotten), Southern Sweden (all other Swedish counties except the three large cities Stockholm, Göteborg, and Malmö), and the three large city regions (Stockholm, Göteborg, and Malmö). The 1990 Swedish Population Census included data for region of residency for 73% of the study population.

**Statistical analysis**

Person-years at risk (i.e. number of persons at risk multiplied by time at risk) were calculated from the time at which subjects were included in the study (in January 1987 or later) until first hospitalization for PSVT, death, emigration or the end of the study period (December 2010). Crude hospitalization rates were calculated using the number of cases of PSVT recorded as numerator and the sum of person-years...
of exposure for all the individuals prior to onset of the disease as denominator. All age-adjusted hospitalization rates are presented per 100,000 person-years. The 95% confidence interval (CI) was calculated for each hospitalization rate and hospitalization rate ratio. Mid-P exact test was used to calculate confidence intervals [29]. Age- and sex-adjusted rates were calculated using the following: the 2013 European Standard Population, the World Health Organization’s (WHO) new World Standard Population, the 1990 US Census standard population, and the 2000 US Census standard population. Poisson regression was used to test time trends. All the analyses were performed using Stata 14 software (Stata Statistical Software: Release 14. College Station, TX: StataCorp LP).

**Results**

A total of 42,765 patients were discharged with a diagnosis of PSVT between 1987 and 2010; females comprised 56% of these. Females were significantly older than males (mean 61.9 [95% CI 60.7–62.2] versus 59.6 [95% CI 59.4–59.9] years, p-value < .0000001 for t-test). Total person-years for the study period was 227,522,888. Table 1 displays the general descriptive statistics. The overall hospitalization rate for PSVT adjusted to the 2013 European Standard Population was 20.0 per 100,000 person-years (95% CI 19.3–20.7). The female/male SIR was 1.1 (95% CI 1.08–1.12). We also adjusted our crude rates to the US 1990 census standard population for a more suitable comparison to the previous US study [16]. The overall hospitalization rate after adjustment to the 1990 US census was 15.1 (95% CI 14.5–15.7) per 100,000 person-years. The male and female hospitalization rates were 14.3 (95% CI 13.5–15.2) and 16.0 (95% CI 15.1–16.8) per 100,000 person-years, respectively. In addition, we also adjusted to the 2000 US census and the WHO new World Standard Population. The overall hospitalization rate after adjustment to the WHO Standard population was 12.8 (95% CI 12.7–13.0) per 100,000 person-years. The male and female hospitalization rates were 12.1 (95% CI 11.9–12.3) and 14.4 (95% CI 14.2–14.6) per 100,000 person-years, respectively.

Regional hospitalization rates showed no major differences. The hospitalization rates in the three major city areas (Stockholm, Gothenburg, and Malmö) (15.3 per 100,000 person-years), northern Sweden (15.5 per 100,000 person-years), and southern Sweden (15.6 per 100,000 person-years) were similar.

**Age and incidence rates**

The hospitalization rate increased with the patient’s age (Figure 1). Figure 1 shows the age-specific hospitalization rates for males and females. The hospitalization rates showed a bimodal pattern. The hospitalization rate was higher in the first age-group (aged 0–4 years) compared to the second age group (aged 5–9 years). Thereafter, there was a steady increase in hospitalization rate with age (Table 2). The highest hospitalization rates were observed in individuals 80–84 years of age (67.12 per 100,000 person-years). In the very oldest patients, the hospitalization rates decreased (85+ years).

**Sex and hospitalization rates**

The overall IR for PSVT was higher in females compared with males (Table 2). The overall female/male SIR was 1.1 (95% CI 1.08–1.12). There was a significantly higher hospitalization rate among males compared to females only in the 0–4 age group. The hospitalization rates were 5.54 for males and 3.07 among females resulting in a SIR of 1.7 (95% CI 1.2–2.5).

**Time trends**

Figure 2 shows the temporal trends in age- and sex-adjusted hospitalization rates between 1987 and 2010. Hospitalization rates were adjusted to the 2000 U.S Standard population are presented. The age-adjusted hospitalization rates are displayed over time in five-year increments. There was a slight increase in the hospitalization rate for both males and females in the 1992–1996 five-year group, otherwise the hospitalization rate remained relatively stable over time. However, when tested with Poisson regression, there were no statistically significant changes in hospitalization rate over time (p-value = .80).

**Lone PSVT**

A total of 20,011 (46.8%) patients had PSVT as the sole diagnosis without any other diagnosis at the time of hospitalization for PSVT (lone PSVT) (Table 1). Compared with patients with an accompanied comorbidity diagnosis, those with “lone PSVT” were younger (mean age 54 vs. 67 years, p = .0002) (p-value not shown in Table 1). Figure 3 shows the total and sex-specific hospitalization rates for “lone PSVT” compared to the group of PSVT patients with comorbidities (Multi). The sex distribution in the two groups was...
significantly different. The “lone PSVT” group consisted of 41.7% males compared to 48.7% males among PSVT patients with comorbidities ($p = 0.0001$) ($p$-value not shown in Table 1).

**Comorbidities**

Of the 22,754 patients that had PSVT together with other diagnoses, coronary heart disease (CHD) and hypertension were the two most common comorbidities in both sexes (Table 3). The ten most common comorbidities and two other potentially relevant comorbidities are shown in Table 3. There was no significant association between sex and a specific comorbidity ($p$-values not shown in table).

**Differential diagnoses**

Few hospitalized PSVT patients (6.8%) had a potential differential diagnosis registered (ICD-9 and ICD-10 codes) at the same hospitalization (Supplementary Table 1). The only common differential diagnosis was atrial fibrillation, which affected 1879 (4.4%) patients with PSVT. A total of 355 (0.83%) PSVT patients also had a diagnosis of pre-excitation syndrome and 0.93% (399) had a diagnosis of ventricular tachycardia.

**Discussion**

This is the first large epidemiological study of PSVT that presents age- and sex-specific hospitalization rates of PSVT for a whole country. The hospitalization rate was relatively stable over the 24-year study period, which is opposite to the trend for the decline in incidence of many other cardiovascular diseases [30]. This may suggest that the major determinants are not the same as for cardiovascular disorders such as CHD and stroke that have declined in incidence; this can most likely be attributed due to changes in lifestyle. The overall total age-adjusted hospitalization rate was 20.0 per 100,000 person-years. The present study shows a slightly higher hospitalization rate in females, compared with males, except for the youngest age group (0–4 years). The hospitalization rates
showed a bimodal pattern with a first small peak at the age of 0–4 years and a second peak at the age of 80–84 years. That incidence increase with age was also observed by Orejarena et al. [16]. Orejarena et al. showed that the incidence rate per 100,000 person years by age was 13 (95% CI 0–27) for <19 years, 27 (95% CI 13–40) for age 20–64 years, and 122 (95% CI 60–184) for age ≥65 years [16]. However, their paper was not substantial enough (33 cases) to observe the first peak at age of 0–4 years.

Manolio et al. have also reported an increased risk of supraventricular arrhythmias with increasing age [31]. However, in selected populations, referral population age of PSVT patients is lower. For instance, in a study by Brembilla-Perrot et al., which included a population of patients referred for clinical and electrophysiological study, only 15.4% of the patients were 70 years or older [32]. Similar to the report by Orejarena et al. we found two distinct sub-sets of patients with PSVT; those with comorbidities and those without comorbidities (lone PSVT). The three most common comorbidities were all cardiovascular disorders, i.e. CHD, hypertension and heart failure. Lone PSVT patients were younger than those with a comorbidity thus suggesting an inherent predisposition.

### Table 2. Numbers and age- and sex-specific hospitalization rates (per 100,000 person years) for PSVT in Sweden, 1987–2010.

| Age in years | Males | | | Females | | | Total | |
|--------------|-------|---|---|-------|---|---|------|---|
|              | N     | IR | 95% CI | N     | IR | 95% CI | N     | IR | 95% CI |
| 0–4          | 392   | 5.54 | 5.02 | 6.12 | 206 | 3.07 | 2.68 | 3.52 | 598 | 4.34 | 4.01 | 4.70 |
| 5–9          | 97    | 1.48 | 1.21 | 1.80 | 93  | 1.50 | 1.22 | 1.83 | 190 | 1.49 | 1.29 | 1.71 |
| 10–14        | 132   | 1.94 | 1.64 | 2.30 | 149 | 2.32 | 1.98 | 2.73 | 281 | 2.13 | 1.89 | 2.39 |
| 15–19        | 349   | 4.98 | 4.48 | 5.53 | 327 | 4.92 | 4.42 | 5.49 | 676 | 4.95 | 4.59 | 5.34 |
| 20–24        | 446   | 6.11 | 5.57 | 6.70 | 458 | 6.50 | 5.93 | 7.12 | 904 | 6.30 | 5.90 | 6.72 |
| 25–29        | 430   | 5.53 | 5.03 | 6.07 | 519 | 6.94 | 6.37 | 7.57 | 949 | 6.22 | 5.84 | 6.63 |
| 30–34        | 455   | 5.65 | 5.15 | 6.19 | 715 | 9.22 | 8.57 | 9.92 | 1170| 7.40 | 6.99 | 7.83 |
| 35–39        | 612   | 7.46 | 6.89 | 8.07 | 871 | 11.02| 10.31| 11.77| 1483| 9.20 | 8.75 | 9.68 |
| 40–44        | 818   | 9.81 | 9.16 | 10.50| 1150| 14.35| 13.54| 15.20| 1968| 12.03| 11.51| 12.58|
| 45–49        | 1074  | 13.36| 12.59| 14.18| 1403| 18.16| 17.23| 19.14| 2477| 15.71| 15.11| 16.34|
| 50–54        | 1415  | 18.81| 17.85| 19.81| 1591| 21.89| 20.84| 22.99| 3006| 20.32| 19.61| 21.06|
| 55–59        | 1726  | 25.04| 23.88| 26.24| 1862| 27.55| 26.33| 28.83| 3588| 26.28| 25.43| 27.15|
| 60–64        | 1932  | 31.42| 30.05| 32.85| 2018| 32.57| 31.18| 34.02| 3950| 31.99| 31.01| 33.01|
| 65–69        | 2076  | 39.66| 37.99| 41.40| 2302| 41.36| 39.70| 43.08| 4378| 40.53| 39.35| 41.75|
| 70–74        | 2311  | 52.86| 50.75| 55.06| 2571| 50.86| 48.93| 52.87| 4882| 51.79| 50.36| 53.26|
| 75–79        | 2243  | 64.60| 61.98| 67.33| 2845| 63.08| 60.80| 65.44| 5088| 63.74| 62.01| 65.52|
| 80–84        | 1463  | 62.56| 59.43| 65.85| 2500| 70.11| 67.42| 72.92| 3963| 67.12| 65.06| 69.24|
| >85          | 994   | 52.38| 49.22| 55.74| 2220| 61.02| 58.53| 63.61| 3214| 58.06| 56.09| 60.10|
| Total        | 18,965| 16.77| 16.54| 17.05| 23,800| 20.79| 20.53| 21.06| 42,765| 18.80| 18.62| 18.97|

Age in years, N: number of cases; IR: incidence rate; CI: confidence interval. IR and 95% CI values are correct to two decimal.

**Figure 2.** Age- and sex-adjusted temporal trend in hospitalization rate of PSVT in Sweden 1987–2010. Hospitalization rates were adjusted to the 2000 U.S. Standard Population.
Comparison with previous research

No descriptive epidemiological study of PSVT has previously been published for Swedish or other European adult populations. Disease-specific estimates of PSVT have been based on small sample sizes and on data collection before 1990 [16]. A small epidemiological study based on a single hospital in Wisconsin USA by Orejarena et al. showed a mean age for PSVT patients of 57 years; a figure that is close to our estimate of 60.92 years [16]. Compared to the research conducted by Orejarena et al., the incidence estimates in the present study are lower [16]. Orejarena et al. reported an incidence rate of 35/100,000 person-years (95% confidence interval, 23 to 47/100,000). Our study only included inpatients and it is likely that some PSVT patients were treated as outpatients. However, the Orejarena et al. study was small (33 cases) and was from a single centre in the USA. For instance, we identified 1745 PSVT patients under the age of 20 years, while Orejarena et al. only included four patients below the age of 20 years. Orejarena et al. used the 1990 U.S. census as the standard population to calculate age- and gender-adjusted rates. Since our estimates were considerably lower, we adjusted our crude hospitalization rates to the 1990 US census to make a comparison to the rates described by Orejarena et al. In the present study, the overall hospitalization rate after adjustment to the 1990 US census was 15.1 (95% CI 14.5–15.7) per 100,000 person-years. Thus, the observed differences between the present study and Orejarena et al. become even greater.

Orejarena et al. found that females had a two times higher risk of developing PSVT than males [16]. We confirmed that females have a higher risk for PSVT but we only found a slight difference. A contributing cause could be that we have also included more children in our study. The Marshfield Epidemiologic Study Area (MESA) study included only three patients under the age of 20 [16]. Paediatric reports have, just as the present study, shown a higher incidence in males at young age, which we confirm [17,21]. However, the

Table 3. Number and age of hospitalized PSVT patients with the most common comorbidities are presented.

|                   | Men          |        |        |       |        | Women          |        |        |       |
|-------------------|--------------|--------|--------|-------|--------|----------------|--------|--------|-------|
|                   | N | % (of all) | Mean age | Min | Max | N | % (of all) | Mean age | Min | Max |
| CHD               | 2641 | 13.9 | 71.6 | 17 | 99 | 2145 | 9.0 | 75.7 | 18 | 99 |
| Hypertension      | 1725 | 9.1 | 66.8 | 21 | 94 | 2284 | 9.6 | 71.5 | 7 | 99 |
| Diabetes          | 1108 | 5.8 | 68.9 | 19 | 94 | 1158 | 4.9 | 72.1 | 9 | 98 |
| Atrial Fibrillation | 989 | 5.2 | 64.7 | 0 | 96 | 877 | 3.7 | 72.1 | 6 | 101 |
| Heart failure     | 1525 | 8.0 | 72.5 | 0 | 98 | 1390 | 5.8 | 78.0 | 0 | 101 |
| Valvular heart disease | 404 | 2.1 | 65.5 | 0 | 96 | 469 | 2.0 | 70.6 | 0 | 96 |
| Congenital heart disease | 179 | 0.9 | 23.6 | 0 | 78 | 161 | 0.7 | 33.6 | 0 | 81 |
| Stroke            | 221 | 1.2 | 72.1 | 11 | 93 | 244 | 1.0 | 76.0 | 27 | 99 |
| Cardiomyopathy    | 216 | 1.1 | 56.1 | 0 | 86 | 139 | 0.6 | 58.1 | 0 | 91 |
| Hyperthyroidism   | 24 | 0.1 | 64.3 | 24 | 86 | 98 | 0.4 | 66.1 | 21 | 91 |
| Pulmonary disease | 812 | 4.3 | 71.3 | 0 | 94 | 974 | 4.1 | 69.8 | 5 | 99 |
| Chronic kidney disease | 158 | 0.8 | 70.0 | 24 | 93 | 94 | 0.4 | 74.4 | 23 | 100 |
mal tachycardia, atrioventricular re-entrant nodal atrial paroxysmal tachycardia, atrioventricular paroxysmal tachycardia, junctional paroxysmal tachycardia or nodal paroxysmal tachycardia.

One of the strengths of the present study is that we confirmed many of the main findings in the study by Orejarena et al. and also previous paediatric studies [16–18]. This suggests that our study gives a valid estimate of the epidemiology of PSVT and also indicates that the generalizability of our study is high. We identified 1879 (4.4%) patients with PSVT that at the same hospital admission also had a diagnosis of atrial fibrillation (AF). This could mean that the diagnosis of PSVT in 4.4% of the patients might be incorrect. However, the previous study by Orejarena et al. found that atrial fibrillation is a common comorbidity in PSVT patients [16]. Orejarena et al. had 33 patients, of whom 18% had an associated AF diagnosis [16]. Thus, it is possible that some patients had episodes both of PSVT and atrial fibrillation during the same hospitalization. Totally only 6.8% of the patients had differential diagnoses indirectly suggesting that at least in 93% the PSVT diagnosis is correct. However, whether these differential diagnoses are correct or not is not possible to determine. For instance, 0.93% of PSVT patients also had a diagnosis of VT, which might be incorrect. However, in the literature several cases of VT have been described in patients treated for PSVT [16,33–35].

A possible disadvantage is that some patients may be treated as outpatients. We do not know how the outpatient incidence rate of PSVT has changed during the period, for instance whether it has increased due to better outpatient diagnosis with Holter monitoring. As there were only inpatients in this study, this could be an inherent bias that could skew the age-specific results. For instance, it is possible that small children with PSVT and older patients with PSVT could be more likely to be treated as inpatients instead of being treated as outpatients. As a minority of patients are selectively admitted in Sweden, the present data suggests that the incidence of newly diagnosed PSVT is relatively constant over time.

Conclusions

We have examined hospitalization rate and descriptive epidemiology for PSVT in the Swedish national discharge registry. Our nationwide findings convey new and relevant perspectives on PSVT. Unlike many other cardiovascular diseases that have declined in incidence, the hospitalization rate of PSVT was stable over time. PSVT is slightly more common in females than males. The hospitalization rate of PSVT is highest in old age but a bimodal pattern was observed with a
small peak in the first years in life. The patients with lone PSVT are younger than those with comorbidities, which suggests an inherent predisposition.

**Ethical approval**

The study was approved by the Ethics Committee of Lund University, Sweden (approval number 409/2008, with amendments approved on 1 September 2009 and 22 January 2010). It was performed in compliance with the Declaration of Helsinki. Consent was not obtained but the presented data are anonymized and there is no risk of identification. Informed consent was waived as a requirement by the ethics committee.

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**Disclosure statement**

The authors declare that they have no competing interests.

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**Data availability**

The dataset supporting the conclusions of this article is still subject to further analyses, and will continue to be held and managed by the Center for Primary Health Care Research, Lund University/Region Skåne, Sweden. Relevant anonymized patient-level data are available from the authors on request.

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