

Supraventricular Tachycardia Ablation and Effects on Anxiety Medications

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Abstract

Background: Patients with true paroxysmal supraventricular tachycardia (SVT) are frequently misdiagnosed with panic or anxiety disorders due to similar symptoms of palpitations, light-headedness, dyspnea, or chest discomfort. Unrecognized SVT can lead to unnecessary management with anxiety medications. Treatment of SVT with catheter ablation may lead to reduction in anxiety medications. **Methods:** A total of 175 patients underwent successful SVT ablation between January 1, 2010 and December 31, 2020. We examined symptoms at presentation, psychiatric medications prior to SVT ablation, comorbidities, and psychiatric medications at 3 months post-ablation. **Results:** 15% of patients who underwent successful SVT ablation were being treated with psychiatric medications and were included in the final study population. The most common symptoms were palpitations (80.77%), followed by dizziness (42.31%), and shortness of breath (34.62%). The average number of medications prior to ablation was 1.42 and decreased down to 1.08 at 3 months post-ablation ($p = 0.04$). The average number of SSRIs, SNRIs, and other anxiolytics were also decreased but were not statistically significant. **Conclusion:** In patients with anxiety and paroxysmal supraventricular tachycardia, catheter ablation is associated with reduced average number of psychiatric medications.

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ABSTRACT

Background : Patients with true paroxysmal supraventricular tachycardia (SVT) are frequently misdiagnosed with panic or anxiety disorders due to similar symptoms of palpitations, light-headedness, dyspnea, or chest discomfort. Unrecognized SVT can lead to unnecessary management with anxiety medications. Treatment of SVT with catheter ablation may lead to reduction in anxiety medications.

Methods : A total of 175 patients underwent successful SVT ablation between January 1, 2010 and December 31, 2020. We examined symptoms at presentation, psychiatric medications prior to SVT ablation, comorbidities, and psychiatric medications at 3 months post-ablation.

Results : 15% of patients who underwent successful SVT ablation were being treated with psychiatric medications and were included in the final study population. The most common symptoms were palpitations (80.77%), followed by dizziness (42.31%), and shortness of breath (34.62%). The average number of medications prior to ablation was 1.42 and decreased down to 1.08 at 3 months post-ablation ($p = 0.04$). The average number of SSRIs, SNRIs, and other anxiolytics were also decreased but were not statistically significant.

Conclusion : In patients with anxiety and paroxysmal supraventricular tachycardia, catheter ablation is associated with reduced average number of psychiatric medications.

KEY WORDS: SVT, SVT ablation, anxiety, PSVT, PSVT Ablation

INTRODUCTION

Paroxysmal supraventricular tachycardia (PSVT) describes tachycardias with abrupt onset and termination of regular tachycardias originating above the bundle of His [1]. This can include atrial tachycardia, AV nodal reentrant tachycardia (AVNRT), and AV reentrant tachycardia (AVRT) [1]. The prevalence of PSVT has been reported to be approximately 2.29 per 1000 persons and an incidence of 36 per 100,000 persons per year [2]. Symptoms of PSVT vary and include palpitations, shortness of breath, fatigue, chest pain, near syncope, diaphoresis, and anxiety [2].

PSVT has been associated with anxiety and panic disorders. This association may be due to the sudden onset of tachycardia causing increased anxiety and stress levels [3, 4, 5]. However, the symptoms of PSVT appear to mimic anxiety and may offer another etiology for this relationship. One study found that 67% of patients with PSVT could be diagnosed with panic disorder based on the previous DSM-IV criteria [6]. In the same

study, it was found that physicians attributed the symptoms of PSVT to panic, anxiety, or stress in 54% of patients [6]. Multiple studies have found that catheter ablation for PSVT decreased stress and anxiety levels [7, 8, 9,10]. However, these studies utilized symptomatic scoring systems such as the WHOQOL-BRIEF domain scores and the SF-36 Questionnaire. To date, there has not been a study examining the effects of PSVT ablation on anxiety related medication usage.

The purpose of this study is to examine the effect of catheter ablation on psychiatric medication utilization in patients with paroxysmal supraventricular tachycardia. We hypothesize that there will be a decrease in the number of psychiatric medications utilization post-ablation.

METHODS

Data Source

This is a retrospective analysis of all patients who underwent catheter ablation procedures for supraventricular tachycardia between January 1, 2010 and December 31, 2020. A research protocol was designed and approved by the Institutional Review Board (IRB) at the University of Texas Health San Antonio. Medical records were manually reviewed and data collected by the research team.

Patient Selection

Patients who underwent a catheter ablation for PSVT from January 1, 2010 to December 31, 2020 were examined. Psychiatric medications that were prescribed to the patient prior to ablation were recorded. Symptoms of PSVT were also noted. Patients that were not on any psychiatric medications and patients with unsuccessful ablation were excluded. Of the included patients, the number of psychiatric medications at 3 months post-ablation were noted. Baseline characteristics including age, ethnicity, gender, and cardiovascular medications were recorded.

Outcome Measures

The primary outcome was the number of psychiatric medications for PSVT patients pre- and 3 months post-ablation. Patients that were prescribed psychiatric medications were followed to examine the difference in number of medications at 3 months post-ablation. Medications evaluated were serotonin selective reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs), benzodiazepines (BZDs), anxiolytics, antipsychotics, tricyclic antidepressants, buspirone, trazadone, and bupropion.

Statistical Methods

Mean number of psychiatric medications, mean number of SSRIs, mean number of SNRIs, mean number of BZDs, mean number of other anxiolytics, and mean number of antipsychotics were analyzed for differences based on the paired samples t-test. P-values less than 0.05 were regarded as statistically significant.

RESULTS

Between January 1, 2010 and December 31, 2020, 175 patients underwent SVT ablation. 15% of these patients were being treated with psychiatric medications and were included in the final study population. Patient characteristics can be found in Table 1. The average age was 50.08 ± 17.92 years. 57.7% were female. 26.9% had been diagnosed with hypertension. 65.4% of PSVT patients taking psychiatric medications had a formal diagnosis of generalized anxiety disorder. In terms of medical management, 46.2% of these patients were on beta blockers, 3.9% on calcium channel blockers, 15.4% on antiarrhythmic medications, and 3.9% on direct oral anticoagulants (DOACs). With regards to presentation of PSVT, the most common symptoms reported were palpitations (80.77%), followed by dizziness (42.31%), and shortness of breath (34.62%) (Figure 1).

Psychiatric Medications

The average number of psychiatric medications prior to ablation was 1.42 and was reduced at 3 months post-ablation to 1.08 (p-value 0.04). When breaking down by categories, the average number of SSRIs prior

to ablation was 0.54 and at 3 months post-ablation it was 0.42 (p-value 0.18). The average number of SNRIs decreased from 0.19 to 0.15 (p-value 0.33). The average number of anxiolytics also decreased from 0.31 to 0.19 (p-value 0.18). Finally, the number of antipsychotics remained stable with an average of 0.12 prior to ablation and 0.15 at 3-months post-ablation (p-value 0.57) (Table 2).

DISCUSSION

The main findings of this study demonstrate that catheter ablation can lead to a decrease in mean total psychiatric medications in PSVT patients that were being treated with psychiatric medications. Previous studies demonstrated that ablation improve subjective symptoms through scoring systems [7,8,10]. This is the first study that provides objective evidence that mean number of psychiatric medications significantly decrease in these patients.

Paroxysmal Supraventricular Tachycardia (PSVT) is defined as a clinical syndrome noted by the presence of regular and rapid tachycardia [1]. Palpitations, dyspnea, hyperventilation, syncope, sweating, chest pain, and anxiety are the most reported symptoms [2]. Our study demonstrated similar presentations with the most common complaint being palpitations. In a previous study, 67% of patients with PSVT had symptoms that were consistent with the diagnosis of panic disorder, based on the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV [6]. Per the updated DSM-V, the criteria remain similar and therefore PSVT could continue to remain mis-diagnosed as a panic or anxiety disorder [11].

It has been reported that anxiety may be exacerbated by PSVT episodes. The sudden onset of PSVT can trigger anxiety disorders in patients [3]. One study reported that anxiety disorder has been present in approximately 25% of patients with PSVT; interestingly, the same study reported that PSVT was unrecognized in over 50% of the time [6]. As anxiety levels increase, patients are at an increased risk for further PSVT [5,9]. Therefore, patients can often get caught between anxiety and panic attacks between episodes of PSVT. This confounds the clinical picture, leading to misdiagnosis, incorrect management and potentially escalating anti-anxiety medications.

Catheter ablation is a Class 1 recommendation for the treatment of PSVT based on the 2015 American College of Cardiology/ American Heart Association/ Heart Rhythm Society guidelines [1]. Ablation has a high success rate, greater than 93% dependent on the mechanism [12,13] with a minimal complication rate [12]. It is highly effective for eliminating further episodes of PSVT [14,15] and has been proven to be cost-effective when compared to chronic antiarrhythmic drug therapy [8, 16-19]. However, there has been less evidence on the effects of ablation on anxiety in patients with PSVT. Current studies utilized subjective scoring systems to demonstrate improvement in these psychiatric disorders. Yildirim et al utilized the WHOQOL-BRIEF domain scores [8, 20] and demonstrated a statistically significant improvement post-ablation. Papiashvilli et al utilized the State and Trait Anxiety Inventory (STATI) and found that PSVT patients had improved situational and general anxiety levels [7, 21]. The same group also utilized the Short Form health questionnaire (SF-36) and found significant improvement in physical, social, and emotional health scores after ablation [10, 22]. Our study further supports this data by providing objective evidence of the effect of PSVT ablation on anxiety disorders.

We examined the mean number of medications and found a significant decrease in the average number of psychiatric medications. We also examined different types of medications including SSRIs, SNRIs, anxiolytics such as bupropion, buspirone, and trazadone, benzodiazepines, and antipsychotics. These medications were chosen due to the current medical management of anxiety and panic disorders [23,24]. SSRIs and SNRIs are often the first line treatment for anxiety. Typically, one agent is chosen and titrated up to the maximum dose. If the medication does not provide a desired outcome, the patient is switched to another agent and the process is repeated. Cases that are refractory will be supplemented with other anxiolytics or benzodiazepines as needed [25]. If the anxiety is uncontrolled with the previous process, antipsychotics may be utilized [26]. Therefore, we wanted to look at the total number of psychiatric medications, as well as each individual subtype, as a measure of anxiety disorder severity. For patients with uncontrolled anxiety, we expect the average number of psychiatric medications to increase based on current guidelines. We found that patients

with SVT ablation was associated with a decrease in the average number of psychiatric medications. Due to having similar symptoms, SVT may have been misdiagnosed as anxiety and panic disorders, leading to excessive psychiatric medications. Ablation then abated symptoms and may have led to decreased average number of psychiatric medications.

The main limitation of our study was the sample size. Other modes of managing anxiety, such as cognitive therapy, exist [27] but were not recorded. Larger prospective studies may be needed to further examine the relationship with psychiatric medications, cognitive therapy, and SVT ablation.

CONCLUSION

In patients with anxiety disorder and paroxysmal supraventricular tachycardia, SVT ablation is associated with lower average number of psychiatric medications.

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Table 1. Patient Demographics of PSVT Patients Taking Psychiatric Medications.

Gender

Male (n, %)	11 (42.3%)
Female (n, %)	15 (57.7%)
Race	Race
Caucasian (n, %)	15 (57.7%)

Hispanic (n, %)	8 (30.8%)
African American (n, %)	0 (0%)
Asian American/ Pacific Islander (n, %)	3 (11.5%)
Other	0 (0%)
Medical History	Medical History
Hypertension (n, %)	7 (26.9%)
Asthma (n, %)	8 (11.5%)
Chronic Obstructive Pulmonary Disease (n, %)	1 (3.9%)
Anxiety (n, %)	17 (65.4%)
Other Medications Prior to Ablation	Other Medications Prior to Ablation
Beta Blockers (n, %)	12 (46.2%)
Calcium Channel Blockers (n, %)	1 (3.9%)
Anti-Arrhythmic Drugs (n, %)	4 (15.4%)
Direct Oral Anticoagulants (n, %)	1 (3.9%)

Table 2. Psychiatric Medications of PSVT Patients.

	Pre-ablation	3 months post-ablation	P-value
Mean Number of Psychiatric Medications	1.42	1.08	0.04
Mean Number of SSRIs	0.54	0.42	0.18
Mean Number of SNRIs	0.19	0.15	0.33
Mean Number of Other Anxiolytics	0.31	0.19	0.18
Mean Number of Antipsychotics	0.12	0.15	0.57

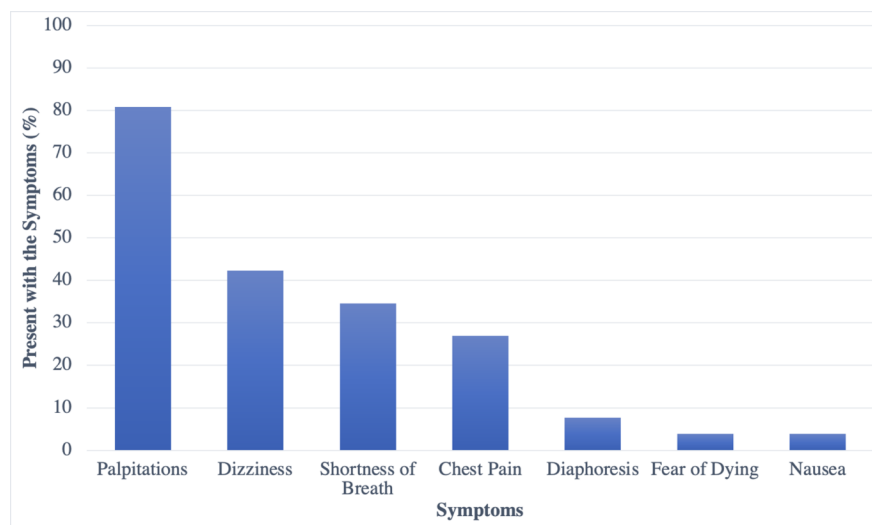


Figure 1. Most Common Symptoms of Patients with PSVT and Prescribed Psychiatric Medications