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The effect of radiofrequency ablation treatment on quality of life and anxiety in patients with supraventricular tachycardia

O. YILDIRIM, OC. YONTAR[1], M. SEMIZ[4], A. ERDEM[2], F. CANAN[3], G. YONTAR[4], N. KUĞU[4]

Department of Psychiatry, Faculty of Medicine, Abant Izzet Baysal University, Bolu, Turkey
[1]Cardiology Department, Sivas Numune Hospital, Sivas, Turkey
[2]Department of Cardiology, Faculty of Medicine, Abant Izzet Baysal University, Bolu, Turkey
[3]Department of Psychiatry, Izzet Baysal Mental Health Hospital, Bolu, Turkey
[4]Department of Psychiatry, Faculty of Medicine, Cumhuriyet University, Sivas, Turkey

Abstract. – AIM: Paroxysmal supraventricular tachycardia (PSVT) has been shown to be associated with poor outcome in psychological status and quality of life. This study aimed to assess the quality-of-life and anxiety in patients with PSVT and to investigate the influence of radiofrequency ablation (RFA) treatment on these parameters.

MATERIALS AND METHODS: Fifty patients with newly diagnosed PSVT with electrophysiologic study and treated with RFA, were enrolled in the study and 50 healthy age-and sex-matched individuals. The brief version of World Health Organization Quality of Life Scale and the state-trait anxiety inventory were administered to controls and all patients before and three months after the RFA procedure.

RESULTS: At baseline, in comparison with the control group, the patients with PSVT exhibited greater anxiety average scores ($p < 0.05$). After RFA procedure, the patients with PSVT exhibited significant improvement in anxiety, quality of life and health satisfaction scores. Statistically significant difference between the controls and the patients in respect to state and trait anxiety average scores disappeared after treatment ($p > 0.05$).

CONCLUSIONS: In this study, normalization of anxiety and quality of life is associated with RFA treatment for patients with PSVT. This finding need to be confirmed by larger scale clinical trials with long-term quality of life follow-up in higher number of patients.

Key Words:
Anxiety, Paroxysmal supraventricular tachycardia, Radiofrequency ablation, Quality-of-life.

Introduction

The term paroxysmal supraventricular tachycardia (PSVT) comprises many arrhythmia types, of which the most common are atrioventricular nodal reentrant tachycardia (AVNRT) and atrioventricular reentrant tachycardia (AVRT)[1]. Palpitation, dyspnea, hyperventilation, syncope, sweating, chest pain and anxiety are most types of symptoms[2]. Psychological symptoms such as depressed mood are also common in PSVT[3]. Sudden onset of tachycardia may lead to or trigger anxiety disorders (AD) in patients[4]. Anxiety disorder has been found to be present in approximately 25% of patients with PSVT[5]. These features of PSVT affect the patients' psychological status and quality of life in a negative manner.

Drug treatment or radiofrequency ablation (RFA) methods are used for the management of supraventricular tachycardia. However, medical treatment might be challenging due to adverse effects and resistance to treatment[6]. Radiofrequency ablation which is associated with less than 5% complication and over 90% success rates in the treatment of supraventricular tachycardia is an invasive electrophysiological method[7].

We aimed to investigate the effects of RFA method on the quality of life and anxiety state of patients with PSVT and the relationship of these effects with the sociodemographic characteristics of the patients.

Materials and Methods

Study Population

Fifty consecutive patients with newly diagnosed paroxysmal supraventricular tachycardia with electrophysiologic study (EPS) and treated with RFA, were enrolled in the study. If arrhythmia could not be documented by surface electrocardio-

Corresponding Author: Alim Erdem, MD; e-mail: cardiology14@gmail.com

gram, some of the patients having typical paroxysmal palpitation for at least six months were evaluated by electrophysiological studies and if tachycardia could be induced, RFA was planned. Also patients complaining of palpitations and having significant preexcitation on ECG, and those with arrhythmia on Holter monitoring, were scheduled for RFA. Patients who received any medical treatment (calcium channel blockers, beta blockers or specific antiarrhythmic drugs) in the last three months, patients with tachycardia episodes less than once a week, patients with atrial fibrillation or atrial flutter and pregnant patients were excluded from the study. Detailed physical examination, ECG, echocardiography, Holter recordings and preoperative laboratory tests were performed in all patients. The control group consisted of 50 healthy subjects, age-matched and sex-matched individuals. The study was approved by the Regional Ethical Review Board and written informed consent was obtained from all patients. The study complied with the Declaration of Helsinki. All patients received written information about the study before hospital admission.

Electrophysiological Study and Conventional Ablation Procedure

Before ablation, all patients received intracardiac electrophysiological testing to confirm the diagnosis and map the ablation target. A decade electrode catheter (Medtronic, Inc., USA) was positioned in the coronary sinus via the subclavicular vein. Two quadrapolar electrode catheters (Medtronic, Inc.) were inserted in the His bundle and right ventricular apex. Programmed stimulation was conducted in the high right atrium and right ventricular apex to diagnose atrioventricular nodal slow-fast pathway reentrant tachycardia or atrioventricular accessory pathway.

RFA was performed by two experienced electrophysiologists. Quadripolar diagnostic catheters were placed in high right atrium, bundle of His and right ventricle (7F, 110 cm, Marinr® SC Series, Medtronic, Minneapolis, MN, USA), and decapolar coronary sinus catheter (7F, 90 cm, Marinr® CS Series, Medtronic, USA) and 4 mm ablation catheter (7F, 110 cm, RF Marinr® MC, Medtronic, USA) were used in the procedures. A 60 Watt RF generator (Atakr® II RF Ablation System, Medtronic, USA) was used for ablation.

Questionnaires

The brief (26-item) version of World Health Organization Quality of Life Scale (WHOQOL-BREF, 8) and the state-trait anxiety inventory (STAI, 9) were administered to all patients before and three months after the RFA procedure. WHOQOL-BREF has been developed by WHO and its Turkish version has been validated by Eser et al in 1998[10]. The first item consisting of the patient's self assessment of quality of life and the second item questioning patient's satisfaction with his/her health, are not included in the above-mentioned domains and these items are evaluated individually. The scale consists of 4 domains: physical health, psychological health, social relationships and environment, and measures the quality of life in these domains. Physical health domain measures the ability to perform daily living activities, treatment compliance, pain, sleep and employment potential. Psychological health domain includes questions on body image and physical appearance, positive and negative feelings, self-esteem, learning and concentration. Social relationships domain includes personal relationships, social support and sexual life. Environment domain consists of financial resources, physical safety, access to health services, and opportunities and participation for leisure/recreation activities. To measure the level of anxiety we used the STAI, a self-report questionnaire that evaluates feelings of apprehension, tension, nervousness, and worry. Turkish version of STAI has been validated by Oner in 1977[11] WHOQOL-BREF and the STAI were also administered to control group.

Statistical Analysis

All statistical analyses were performed using the SPSS software package 15.0 (SPSS Inc., Chicago, IL, USA). Data are presented as frequencies and percentages for categorical variables and mean ± SD or median for continuous variables, unless otherwise indicated. The groups were compared using the Student's *t*-test for the continuous variables and the chi-square test for the categorical variables. Correlation between continuous variables was determined by Pearson correlation coefficients. A value of $p < 0.05$ was considered statistically significant.

Results

Sociodemographic Characteristics

Fifty patients, including 22 men (44%) and 28 women (56%) were included in the study. Mean age of the study population was 44.08±11.12

Table I. Comparison of WHOQOL-BREF domain scores before and after the procedure.

WHOQOL-BREF domains	Before the procedure	After the procedure	*p* value
Item 1 (min-max)	3 (2-4)	3 (2-5)	< 0.01
Item 2 (min-max)	2 (1-4)	4 (1-5)	< 0.01
Physical health (mean ± SD)	10.99 ± 1.91	13.61 ± 1.87	< 0.01
Psychological health (mean ± SD)	12.38 ± 1.81	14.02 ± 1.70	< 0.01
Social relationships (mean ± SD)	12.37 ± 2.52	12.8 ± 2.40	0.014
Environment (mean ± SD)	13.19 ± 1.71	13.41 ± 1.73	0.025

years. Mean age of men was 44.6±10.5 years and mean age of women was 43.7±11.6 years. Seven patients (14%) were illiterate, and 27 patients (54%) had primary school, 14 (28%) had secondary school and the remaining 2 (4%) had university education. Five patients (10%) were unmarried, 41 (82%) were married, 4 (8%) were widowed. The patients' diagnoses were AVNRT (28 patients, 56%) and AVRT (22 patients, 44%). Eight patients (16%) had a previous diagnosis of diabetes and 6 (12%) patients were previously diagnosed as hypertension; and all of these patients were on medical treatment for these disorders.

Quality of Life and Anxiety Assessment

The scores of WHOQOL-BREF physical health, psychological health, social relationships and environment domains are presented in Table I. The state and trait anxiety average scores of control group were 30.23±3.2 and 31.2±2.8. Before the treatment, state and trait anxiety avarage scores of patient group were 41.4±3.8 and 40.2 ±4.3, respectively. There were statistically significant differences between the groups ($p < 0.05$). After RFA procedure, the scores of state and trait anxiety were 33.6±3.2 and 34.1±2.7, respectively. After RFA procedure, significant improvement was noted in the quality of life and levels of anxiety ($p < 0.05$). Statistically significant difference between the controls and the patients in respect to state and trait anxiety avarage scores disappeared after treatment ($p > 0.05$). The improvements were not significantly related to sociodemographic characteristics such as sex, educational status and marital status of the patients (Table II).

Discussion

To our knowledge, there are a few studies investigating the effects of supraventricular tachycardia and ablation treatment on quality of life and anxiety[12]. However, the effects of SVT and ablation treatment have not been evaluated on all aspects of quality of life.

When factors including outpatient clinic and Emergency Unit admissions, hospitalizations, medications used for treatment, functional loss due to sudden attacks of palpitation are taken into account, it can be noted that supraventricular tachycardia is associated with a great economic burden for the patients[13,14].

Arrhythmias have previously been shown to have a negative impact on patients' quality of life. Bubien et al[15] have reported that atrial fibrillation has a negative impact on patients' quality of life and ablation treatment provides significant improvement in the quality of life of these patients[15]. In another study evaluating the effects of medical

Table II. The relationship of the change in quality of life with sociodemographic characteristic.

WHOQOL-BREF domains	f value (for educational status)	*p* value (for educational status)	f value (for sex)	*p* value (for sex)	f value (for marital status)	*p* value (for marital status)
Item 1	0.343	0.794	0.606	0.440	0.867	0.427
Item 2	0.107	0.956	0.438	0.511	2.640	0.082
Physical health	0.205	0.892	0.000	0.983	0.238	0.789
Psychological health	0.628	0.600	0.138	0.712	0.098	0.907
Social relationships	0.147	0.931	0.093	0.762	0.406	0.669
Environment	0.383	0.766	0.605	0.441	0.087	0.917

treatment on quality of life, it was reported that quality of life was worsened due to drug adverse effects and continuing tachycardia attacks in SVT patients, who were not treated by RFA but received long-term medical treatment[16]. When comparing pharmacologic treatment with RFA, data indicate the advantage of RFA. Antiarrhythmic treatment is associated with potential side effects that may negatively affect quality of life[17].

RFA treatment has previously been demonstrated to significantly improve the quality of life in arrhythmia patients by using the Short Form (SF-36) quality of life scale[18,19]. Meissner et al[19] showed that physical capacity was significantly improved following ablation in patients with supraventricular tachycardia[19]. Wood et al[14] reported that supraventricular tachycardia caused significant limitations in several domains of quality of life such as physical capacity, emotional status and social activities[14]. They assessed the quality of life of patients before and one month after RFA procedure and showed that ablation treatment significantly reduced the negative effects of SVT on work life, sexual life and daily activities and that the patients dramatically returned to their normal life one month after ablation[14]. We determined a significant improvement in the quality of life and health satisfaction of patients following ablation treatment, supporting the previous observations.

Anxiety disorders are common in PSVT. PSVT and AD can occur comorbidly in a chronological sequence, with PSVT possibly precipitating and maintaining AD via interoceptive processes or, alternatively, with AD increasing the risk for PSVT by elevating stress levels[20,21]. Previous studies showed that in patients with PSVT, radiofrequency ablation offers a curative therapy and can reduce anxiety symptoms dramatically[22]. The results of this study have shown that, patients with PSVT have a higher prevalence of anxiety, similar to the literature. Furthermore, RFA was shown to decrease anxiety symptoms in patients with PSVT, concordant with the literature.

Different from previous studies evaluating the effects of RFA on quality of life, WHO Quality of life Scale was used in this study. This scale assesses several domains of quality of life. In addition to several sub-domains, it also evaluates the patient's self assessment of quality of life and health satisfaction through its first two items. We showed a significant improvement in the scores of WHOQOL-BREF in patients following ablation treatment. This improvement was observed in all domains of quality of life including physical, psychological, and social and environment domains, and the improvement was not related to factors such as educational level, sex and marital status.

Conclusions

In this study, we showed that treatment of patients with supraventricular tachycardia by radiofrequency ablation significantly improved patients' quality of life and anxiety levels. Our findings demonstrate that radiofrequency ablation method, which is the most prominent treatment method in the management of paroxysmal supraventricular tachycardia, eliminates the negative psychological and physical effects of the condition by providing cure. These findings need to be confirmed by larger scale clinical trials with long-term quality of life follow-up in higher number of patients.

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