Quality of Life of Cardiac Arrhythmia Patients After Radiofrequency Catheter Ablation

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Abstract

Radiofrequency catheter ablation (RFCA) has been used to treat cardiac arrhythmias in Thailand since 1992. The effect of this procedure on quality of life has not been systematically studied. The purpose of this study was to assess the impact of RFCA on quality of life in patients with cardiac arrhythmias.

Data were collected by interviewing 30 patients from February 1998 to August 1998, before and two months after RFCA. The questionnaire used for this study was created by researchers using Zhan's conceptual framework and SF36 in 4 dimensions – life satisfaction, self-concept and psycho-social well being, health functioning and physical well being, socio-economic and social well being. The questionnaire was validated by experts. Its reliability was tested by using Cronbach's test that gave an alpha coefficient of 0.81.

Our study showed that the overall quality of life scores 2 months after RFCA ($\bar{x}$ = 179.467, SD = 17.005) were higher than before RFCA ($\bar{x}$ = 131.567, SD = 18.680). The results also showed a statistically significant difference (p = 0.000).

Conclusion. It was found that RFCA significantly improved the quality of life of patients with various cardiac arrhythmias. However, this study consisted of a small sample size. Further work in this area with a large sample size is needed to confirm this finding.

Key word : Radiofrequency Catheter Ablation, Cardiac Arrhythmia, Quality of Life

Cardiac arrhythmias are relatively common abnormalities occurring in normal persons and in those with cardiovascular diseases. Arrhythmias can be categorized by sites of the origin into supraventricular and ventricular arrhythmia. Supraventricular tachycardias (SVT) are commonly found in patients 30-35 years of age[1]. Patients with tachyarrhythmia may report mild symptoms, usually

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paroxysmal, or cardiac output can be reduced up to 30 per cent[2]. The episode of symptoms may last a few minutes to 20 hours[3]. These symptoms may then stop spontaneously. Nevertheless, these symptoms are recurrent particularly when triggered by exertion, performing activities and strong emotion such as anger and stress[4-6]. Patients may have mild symptoms such as dizziness, dyspnea, chest pain, palpitations, fullness in the neck to severe symptoms such as hypotension, near syncope or syncope, diaphoresis, heart failure, myocardial infarction and sudden death[7-12]. If the attacks are infrequent and well tolerated, reassurance may be sufficient[13]. However, it is strongly advised that the patients must avoid precipitating factors such as smoking, alcohol, caffeine, strong emotion and activities which increase heart rate and cause arrhythmias[14]. On the other hand, prophylactic therapy is required for the patients who are intolerant and present with severe symptoms, especially in the patients who have high risk professions such as public drivers, airline pilots and athletes. Once attacked by the symptoms, these patients are forced to seek emergency treatment and unscheduled physician visits to control arrhythmias and symptoms[15]. Regardless of how well the patients can tolerate the symptoms, the symptoms usually limit their activities, both physical and social. Impairment of driving ability because of near syncopal or syncopal symptoms has been noted[16]. These may affect health, work, economy, life styles of both the patients and their families. There are considerable effects on the quality of life (QOL).

There are three options for control of symptomatic arrhythmias. These three options are lifelong antiarrhythmic medication, surgery and radiofrequency catheter ablation (RFCA). The first two options have relatively greater limitations compared to RFCA. Drug therapy limitations include lack of complete efficiency, adverse effects, proarrhythmic action and regular scheduled physician visits[16-20]. Surgery is an effective therapy. Nevertheless, surgery usually results in a significant morbidity, increased hospital stay and higher costs compared to RFCA[17]. Generally surgery is three times more costly than that of RFCA[21]. Therefore, RFCA recently is the most cost effective treatment for cardiac arrhythmias[11,18,22,23].

Quality of life is a dynamic concept[24]. It is a difficult concept to define and measure[17]. Culture, ethics, religion and other personal values can influence perception of meaning and consequences of QOL[24]. Improving QOL and decreased mortality are of particular concern to physicians[17]. Use of the term QOL should be avoided when the study addresses only one dimension of the QOL concept such as side effects of treatment or physical activity[9].

QOL is defined in either objective terms, subjective terms or both. It is conceptualized as either unidimensional or multi-dimensional[25]. In objective terms, QOL has been defined as income, employment, education, physical function, housing and purity of air. Zhan defined life satisfaction, well being, health, happiness, self-esteem, adjustment, value of life, meaning of life and functional status as QOL in a subjective dimension[24]. The subjective dimension is based on five factors;[26] 1) physical and material well being, 2) relation with other people, 3) social activity, 4) personal development and fulfillment and 5) recreation. The evaluation of QOL in medical study has been successfully conducted using "SF36" which is a standard, generic health survey instrument[27]. The instrument assesses physical functioning, bodily pain and a sense of vitality of mental and general health. It also evaluates the perception of ability to perform physically, emotional function and social role function.

RFCA has been used to treat cardiac arrhythmias in Thailand since 1992. The effectiveness of RFCA in controlling arrhythmias has been reported[3-6,15]. The effects of this procedure on QOL, nevertheless, have not been systemically studied. The objective of this study was to systematically explore the effects of RFCA on QOL of arrhythmic patients. Zhan conceptual model and SF36 were adapted to construct an instrument in assessing the effects. It is comprised of 4 aspects of subjective dimension; a) life satisfaction, b) self concept and psychosocial well being, c) health and function and physical well being and d) socio-economic and social well being. Therefore, the spiritual and existential dimensions are included in this study.

METHOD

Design. The design of this study was a one group, pretest-posttest design. Data were collected by interviewing the patients before RFCA and 2 months after RFCA, using the same instruments. The time periods were based on the opinions of cardiologists who performed RFCA. These time

periods allowed sufficient time for patients to recover from the procedure and resume normal activities.

Sample. The sample included 30 cardiac arrhythmic patients, 12 years of age and older. These patients had been treated with antiarrhythmic agents for at least 3 months. They underwent successful RFCA at Her Majesty's Cardiac Center, Siriraj Hospital from January 1998 to August 1998. The patients spoke Thai and were willing to participate in the study.

Instrument. The researchers constructed the questionnaire that consisted of 2 parts—demographic data and QOL questionnaires. The QOL questionnaire consisted of 45 items in 4 aspects based on Zhan conceptual framework[24] and SF36[27]. The aspects are life satisfaction, self-concept and psychosocial well being, health functioning and physical well being, and socioeconomic and social well being.

Data analysis. Data were analyzed by using percentage, mean, standard deviation and *t*-test. Paired test was used to compare QOL scores. A significance of $p<0.05$ was set as a priority for all analysis.

RESULTS

A total of 30 patients underwent successful RFCA of supraventricular or ventricular arrhythmias from February 1998 to August 1998. There were 13 men and 17 women, between the age of 12 and 72 years ($\bar{x}$ =38.83 years). The majority of the patients were married (73%, n=23), educated in primary school (53.3%, n=16), and employed (76.6%, n=23). All of them paid for medication treatment that usually cost over 500 baht a month. The indications for RFCA were supraventricular tachycardia (SVT) related to the Wolff-Parkinson-White syndrome (WPW, 9 patients), atrioventicular reentrant tachycardia (AVRT, 3 patients), atrioventricular nodal reentrant tachycardia concealed bypass tract (AVNRT, 8 patients), atrial fibrillation (AF, 3 patients) and atrial tachycardia (AT, 1 patient). The remaining patients had ventricular arrhythmias that were premature ventricular contraction (PVCs, 4 patients) arising from the right ventricular outflow tract (RVOT) and ventricular tachycardias (VT, 2 patients). Out of the 30 patients, 25 (83.3%) had a history of palpitations, 23 (76.7%) had near fainting, 7 (23.4%) had syncope. Most of the patients (22 patients, 73.7%) had tachycardia and felt strong and fast beats in their chests. Nineteen patients (63.3%) had chest pain or tightness in their chests. Other signs were sweating (53.3%). Duration of arrhythmia ranged from 5 months to 26 years ($\bar{x}$ =7.9 years). The frequency of cardiac symptoms before RFCA varied from once a month to 2-3 times a day. Several patients had been admitted because of severe and prolonged cardiac symptoms. The duration of the arrhythmia attack was less than 1 minute to longer than 2 hours. The average duration of an attack was 43 minutes.

Mean overall and subscale scores for QOL both before and 2 months after RFCA are shown in Table 1. The overall QOL scores significantly increased 2 months after RFCA ($p = 0.000$). Two months after RFCA, every subscale QOL scores also significantly increased.

The origin of clinical arrhythmias had a majority impact on QOL. (Table 2) Before RFCA, the patients with supreventricular tachycardia (SVT) had higher QOL scores ($\bar{x}$ =132.60) than ventricular tachycardia ($\bar{x}$ =126.40). QOL scores 2 months after RFCA were significantly increased in both groups of patients.

Before RFCA, the patients with atrial tachycardia (AT, n=1), exhibited lowest QOL scores (Table 3), whereas patients with atrioventricular reentrant, (AVRT, n=3), had highest QOL scores ($\bar{x}$ =146.33). Two months after RFCA, the patients with ventricular tachycardia (VT) demonstrated highest QOL scores ($\bar{x}$ =192.50). Almost all patients' QOL scores 2 months after RFCA were significantly increased at $p<0.05$, except patients with premature ventricular contraction (PVC). These patients with PVC showed an increase in QOL scores 2 months after RFCA at $p=0.072$. The *t*-test could not be computerized for one patient with atrial tachycardia (AT) who underwent RFCA despite a considerable increase in QOL score 2 months after RFCA (182) compared to before RFCA (Table 3).

DISCUSSION

This study was a one group, pretest-posttest design. This type of design is subject to various threats to internal validity that could have been ruled out by the addition of a control group. The changes in the quality of life variables in this

Table 1. Quality of life measurements before and 2 months after radiofrequency catheter ablation (RFCA).

	QOL_0		QOL_2		p value
	$\bar{x}$	SD	$\bar{x}$	SD	
Overall	131.567	18.860	179.467	6.687	0.000
Function	41.733	6.617	56.133	6.587	0.000
Satisfaction	29.000	6.181	44.600	5.706	0.000
Self concept	27.100	5.887	40.537	6.197	0.000
Socio-economic	33.733	4.763	37.867	3.159	0.000

QOL_0 = Quality of life before RFCA. QOL_2 = Quality of life 2 months after RFCA

Table 2. Quality of life measured by origin of arrhythmia.

Type of arrhythmias	No. of patients	QOL_0		QOL_2		p value
		$\bar{x}$	SD	$\bar{x}$	SD	
SVT	24	132.60	18.84	178.84	17.98	0.000
Ventricular	6	126.40	18.99	182.60	11.89	0.005

SVT = Supraventricular tachycardia

Table 3. Quality of life measurements by arrhythmia mechanism.

Diagnosis	No. of patients	QOL_0		QOL_2		p value
		$\bar{x}$	SD	$\bar{x}$	SD	
WPW	9	137.33	25.11	176.78	17.91	0.004
AVRT	3	146.33	11.24	175.67	8.50	0.012
AVNRT	8	130.75	12.22	183.63	22.41	0.001
AF	3	119.00	12.53	173.67	24.38	0.034
PVCs	4	132.33	21.39	176.00	3.00	0.072
VT	2	117.50	16.26	192.50	14.85	0.008
AT	1	111		182		

WPW = Wolff-Parkinson-White syndrome, AVRT= atrioventicular reentrant tachycardia,
AVNRT= atrioventricular nodal reentrant tachycardia, AF = atrial fibrillation, PVC = premature ventricular contraction,
VT = ventricular tachycardias, AT= atrial tachycardia.

study were substantial and consistent across a number of measures.

The results of this study demonstrated that patients with arrhythmias perceived negative impact of their condition on the quality of their lives. Although some of these arrhythmias, such as SVT, are paroxysmal in nature and generally not life threatening, they affect quality of life[17]. Eighty per cent of the patients with SVT reported improvements of QOL after RFCA. Similar findings on improvements of QOL after RFCA have been reported. In the study by Bubein et al,[27] the researchers used SF36 and reported the significant improvements of both SVT and VT one month after RFCA. The results were maintained 6 months after with no significant change between 1 and 6 months after RFCA[27]. In addition, they found persistent low QOL in patients with AF. In this study before

RFCA, we found the lowest QOL in one AT patient whereas the highest QOL was indicated in patients with AVRT. Post RFCA improvements in QOL have also been observed by others[16,17,28,29]. QOL that they observed was health related QOL. In this study we studied QOL in 4 aspects, life satisfaction, self-concept and psychosocial well being, health functioning and physical well being, and socio-economic and social well being. These aspects were the significant determinants of QOL before and after RFCA.

The improvements in QOL of the patients after RFCA in this study were probably related to many factors. First, the improved QOL could be related to the reduction of symptoms associated with arrhythmias. These symptoms caused the patients to limit their daily lives, physical and social activities to a significant degree. Most of them had had arrhythmias for a long time ($\bar{x}$ =7.9 years). They might have more severe symptoms and appeared to cope with these symptoms better than those who had had the diseases for a shorter period of time [8,16,29]. After successful RFCA, they were able to resume normal physical and social activities and enjoy life that had been limited. These observations have been reported in studies on patients with AF[28,29] and recurrent arrhythmias,[17] both SVT and VT. Secondly, after RFCA all patients were able to discontinue antiarrhythmic agents they previously taken every single day. Even though some of the patients were satisfied with the symptom controlling effect of the agents to some degree, all episodes of tachycardias were not completely suppressed. The agents also caused undesirable side effects[30] and were costly. The medical expenses were of the great concern for some patients. These factors could possibly lead to anxiety. Third, the curative treatment of arrhythmias is possible with RFCA[16,18,31]. Therefore, the improvements in QOL after RFCA could be the results of cure.

LIMITATIONS

There are some limitations to this study that should be recognized. First, all patients were willing to undergo RFCA. They were motivated and selected after incomplete control of episodes of arrhythmia for a period of time. Second, all of the patients underwent successful RFCA. The patients with unsuccessful RFCA were excluded. The placebo effect of unsuccessful RFCA was not studied. Third, this study described relatively few patients in each group. Fourth, the follow-up period after RFCA was only 2 months.

SUMMARY

RFCA demonstrated improvement in QOL of patients with symptomatic arrhythmias in life satisfaction, self-concept and psychological well being, health functioning and physical well being as well as socio-economic and social well being. Further study with a large sample size and longer follow-up is needed to confirm this study.

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คุณภาพชีวิตผู้ป่วยที่มีการเต้นผิดจังหวะของหัวใจภายหลังการจี้ไฟฟ้าหัวใจ

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ประเทศไทยได้นำวิธีการจี้ไฟฟ้าหัวใจ (Radiofrequency catheter ablation; RFCA) มาใช้รักษาผู้ป่วยที่มีการเต้นผิดจังหวะของหัวใจ ตั้งแต่ปี 2535 แต่ยังไม่ได้มีการศึกษาถึงผลกระทบต่อคุณภาพชีวิตจากการรักษาด้วยวิธีนี้ การศึกษาครั้งนี้จึงมีจุดมุ่งหมายเพื่อศึกษาถึงผลกระทบของการจี้ไฟฟ้าหัวใจต่อคุณภาพชีวิตของผู้ป่วยที่มีการเต้นผิดจังหวะของหัวใจที่มารับการรักษาที่ศูนย์โรคหัวใจสมเด็จพระบรมราชินีนาถ โรงพยาบาลศิริราช โดยการสัมภาษณ์ผู้ป่วยก่อนการจี้ไฟฟ้าหัวใจ และ 2 เดือนหลังการจี้ไฟฟ้าหัวใจ ระหว่างเดือนกุมภาพันธ์ 2541 ถึงสิงหาคม 2541 จำนวน 30 ราย เครื่องมือที่ใช้สัมภาษณ์ผู้วิจัยได้สร้างขึ้นโดยใช้กรอบแนวคิดของซาน (Zhan) ร่วมกับ SF36 ประกอบด้วย 4 ด้านคือ ด้านความพึงพอใจในชีวิตด้านอัตมโนทัศน์และจิตสังคม ด้านสุขภาพและการทำงานของร่างกาย และด้านสังคมและเศรษฐกิจ เครื่องมือนี้ได้ผ่านการตรวจสอบโดยผู้เชี่ยวชาญและมีค่าความเชื่อมั่น = 0.81

ผลการศึกษาพบว่าคุณภาพชีวิตของผู้ป่วยที่มีการเต้นผิดจังหวะของหัวใจ 2 เดือนหลังการจี้ไฟฟ้าหัวใจ ($\bar{x}$ = 179.467, S.D. = 17.005) สูงกว่าก่อนจี้ไฟฟ้าหัวใจ ($\bar{x}$ = 131.567, S.D. = 18.680) อย่างมีนัยสำคัญทางสถิติ (p = 0.000)

คำสำคัญ : การจี้ไฟฟ้าหัวใจ, การเต้นผิดจังหวะของหัวใจ, คุณภาพชีวิต

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