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Factors Contributing to Poor Sleep Quality as Perceived by Heart Transplant Recipients in Taiwan

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ABSTRACT

Background. The aims of this project were to explore the factors contributing to poor sleep quality at 1 to 3 years after heart transplantation (post-HT), and to explore economic problems and social support for HT recipients (HTRs).

Methods. This study used a cross-sectional retrospective triangulation approach combining qualitative and quantitative research method designs. Quantitative data included data from the visual analog scale and the Taiwanese version of the World Health Organization Quality of Life questionnaire. Qualitative data were derived from questions that explored physiological, psychological, and economic factors contributing to poor sleep quality postprocedure for HTRs.

Results. Sixty-four subjects (81% male, 19% female) participated in this research. Their ages ranged from 20 to 70 ($M = 46.88 \pm 12.12$) years old. Their post-HT timeframe ranged from 1 to 4.10 years; 33% received preoperative extracorporeal membrane oxygenation support. Sleeping disturbances were reported by 72.7% of subjects after HT. Poor sleeping quality at 2 to 3 years post-HT ($P = .028$) was a complaint, and was worse than at 1 to 2 years post-HT ($P = .008$). Six physiological (62.5%) and 3 psychological (37.5%) contributing factors were further identified in qualitative interviews. Physiological factors were the major causes affecting their sleep quality 2 to 3 years after HT, whereas psychological factors arose from various family roles, responsibilities, and economic-related pressures.

Conclusions. Medical teams should find the causes that lead to sleep disturbances and use the findings to improve HTR sleep quality. When the family financial status is affected, these teams should offer assistance and suggestions for patients who are unable to work due to post-HT physical decline. Establishing and providing good family support systems or patient support groups may allow patients to obtain physical, psychological, and spiritual comfort.

HEART TRANSPLANTATION (HT) has become the preferred treatment for end-stage heart failure patients when other effective treatment is not available [1]. Patient survival rates have improved after HT to 93% at 3 months, 89% at 1 year, 73% at 5 years, and 55% at 10 years [2]. Although HT may increase life expectancy and improve

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health-related quality of life (HRQoL) [3], patients still suffer physically, psychologically, spiritually, and socially [4]. Sleep disorders in heart failure patients are also associated with HRQoL [5–7]. This study explored factors contributing to poor sleep quality at 2 to 3 years post–heart transplantation (post-HT) as well as economic and social support challenges for HT recipients (HTRs).

MATERIALS AND METHODS

This study used a cross-sectional retrospective triangulation approach combining qualitative and quantitative research method designs to achieve a comprehensive understanding of this complex phenomenon [8–10]. Subjects who had undergone HT in the past 1 to 4 years were recruited from a leading medical center in Taipei, Taiwan. Quantitative data were collected using the Visual Analog Scale and the Taiwanese version of the World Health Organization Quality of Life questionnaire. Semistructured qualitative questions were added to explore factors contributing to poor sleeping quality at 2 to 3 years post-HT as well as to assess economic problems and social support challenges for HTRs.

RESULTS

Sixty-four subjects (81% male, 19% female) participated in this research, all of whom underwent a sleep study. Regarding marital status, 20.3% (n = 13) of patients were single, 65.6% (n = 42) of patients were married, and 14.1% (n = 9) of patients were divorced/widowed/remarried. There were 65.6% (n = 42) of patients who professed religious beliefs and 34.4% (n = 22) of patients who did not profess religious beliefs. In addition, 65.6% (n = 42) of patients did not have regular employment and 64.1% (n = 41) of patients did not have an income.

On the health side, these subjects were 1 to 4 years post-HT procedure. Among them, 48.4% (n = 31) were 1 to <2 years post-HT, 34.4% (n = 22) were 2 to <3 years post-HT, and 17.2% (n = 11) were 3 to <4 years post-HT. There were 48.4% (n = 31) who participated in a clinical trial plan, and 32.8% (n = 21) who used extracorporeal membrane oxygenation/ventricular assist devices before transplantation. In assessing the primary causes of heart failure, 68.8% (n = 44) of patient cases were caused by dilated cardiomyopathy, 23.4% (n = 15) of patient cases were caused by ischemic cardiomyopathy, 4.7% (n = 3) of patient cases were caused by transplant complications of acute rejection, 4.7% (n = 3) of patient cases were caused by chronic rejection, and 1.6% (n = 1) of patient cases were caused by infection (Table 1).

HTRs have worse sleep quality 2 to 3 years after surgery ($P = .028$) (Table 2) as compared to HTRs 1 to 2 years after surgery ($P = .008$). In this study, 72.7% (n = 16) of patients had trouble sleeping after heart transplant surgery. Physiological factors were the major causes of decreased sleep quality among patients 2 to 3 years post-HT. Through qualitative interviews, the causes of diminished sleep quality among HTRs were found to be physiological factors (62.5%; n = 10) and psychological factors (37.5%; n = 6). Among the physiological factors affecting sleep quality were 18.75% (n = 3) of patients with nocturia due to diuretic ingestion, 12.5% (n = 2) of patients with difficulty falling asleep, 12.5% (n = 2) of patients with asthma and body discomfort, 6.25% (n = 1) of patients with abnormal

Table 1. Demographic Characteristics of Patients (n = 64)

		n	%	Mean ± SD				n	%
Post-HT	1–2 y	31	48.4		Income	Y		23	35.9
	2–3 y	22	34.4			N		41	64.1
	3–4 y	11	17.2		Cause of heart failure	Dilated cardiomyopathy		44	68.8
Age	20–49 y	31	48.4	46.88 ± 12.19		Ischemic cardiomyopathy		15	23.4
	50–79 y	33	51.6			Other		5	7.8
Gender	Male	52	81.3		Transplantation complication	Y		7	1.9
	Female	12	18.8				Acute rejection	3	4.7
Marital status	Unmarried	13	20.3				Chronic rejection	3	4.7
	Married	42	65.6				Infection	1	1.6
	Divorced/widowed/remarried	9	14.1			N		57	89.1
Education	High school or less	40	62.5		ECMO	Preoperative ECMO		21	32.8
	College degree or above	24	37.5			Non-ECMO		43	67.2
Religion	Y	42	65.6		CTP	Postoperative CTP		31	48.4
	N	22	34.4			Non-CTP		33	51.6
Stable employment	Y	22	34.4						
	N	42	65.6						

Abbreviations: HT, heart transplantation; Y, yes; N, no; ECMO, extracorporeal membrane oxygenation, used as a bridge to cardiac transplantation; CTP, A 24-month, multicenter, randomized, open-label non-inferiority study of efficacy and safety comparing 2 exposures of concentration-controlled Certican with reduced Neoral versus 3.0 g mycophenolate mofetil with standard-dose Neoral in de novo heart transplant recipients.

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