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The association of quality of life between anxiety and depression in patients with chronic rheumatic heart disease

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Abstract

Objective: The main objective of the study was to measure the association of quality of life between anxiety and depression in patients with chronic rheumatic heart disease.
Methodology: Psychometric assessment (anxiety and depression) of the subjects was measured using HADS. Clinical data were collected from the Department of Cardiology OPD of Safdarjung Hospital, New Delhi. A total of 500 RHD patients and 100 healthy controls were included in the study based on inclusion and exclusion criteria. Data analysis was performed with Chi square test and ANOVA using IBM SPSS version 22.
Findings: Almost 80% of the subjects were suffering from moderate RHD, and 20% were suffering from Severe RHD. Most cases of RHD were suffering from moderate anxiety and depression levels. Among all the variables of SF-36 questionnaire, only pain was only variable associated with anxiety. None of the SF-36 variables was associated with depression in patients with RHD.
Conclusion: It was seen that high levels of anxiety and depression levels are present in patients with RHD. It was also observed that the high anxiety levels in the RHD patients can also be a major cause of depression in patients. The factors related to the disease like physical pain, social functioning, and general health causes high anxiety and depression in the patients when the disease prevails over a long time.

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1. Introduction

Rheumatic Heart Disease (RHD) is a condition that is initiated by the rheumatic fever and results in damaged heart valves of the affected individual. Rheumatic fever is generally caused by group A streptococcal bacterial infection (Marijon et al., 2012).

According to a recent report, there were 15.6 million of existing cases of RHD and each year 233,000 number of deaths caused by RHD and 282,000 new RHD cases were reported globally (Watkins et al., 2017). The epidemiological data presented by the author revealed that the disease

is more prevalent in developing countries due to lack of prevention strategies and poor medical facilities. Today, RHD is almost absent in developed regions such as Europe and North America, but it is still present in parts of Africa, the Middle East, Central, and South Asia, and South Pacific (Carapetis et al., 2016; Pilgrim et al., 2012).

In India, RHD burden is causing an enormous amount of money to be spent on its cure prevention and treatment (Ramakrishnan et al., 2012). Nearly, 20%-25% of the global RHD burden is caused by India. RHD can also be impacted by the psychological aspects over a prolonged time of prognosis. These psychological morbidities negatively impact the neural functioning of the patients causing the low quality of life (Alvarenga & Caldeira, 2009). Results from World Mental Health Survey conducted in 17 countries showed that the specific anxiety disorders (generalized anxiety disorder, panic/agoraphobia, social phobia and post-traumatic stress disorder or PTSD) were generally less prevalent than major depression. Among persons with heart disease, the prevalence of generalized anxiety disorder (GAD) ranged from circa 0.3% in Lebanon to about 5% in Ukraine, US and France (Ormel et al., 2007). Similar data are not available in India.

Various tools such as Hospital Anxiety and Depression Scale (HADS) and Quality of Life (QoL) are used to measure the anxiety and depression in the patients of RHD. HADS is a tool to identify and quantify anxiety and depression (Christoph, 1997). QoL and cognitive functions in RHD patients is reduced in all patients, and it can be assessed by using the Short Form 36 (SF-36) health survey (Idorn, 2013). In India, data regarding QoL associated with anxiety and depression in patients with RHD is scarce. Hence, this study was aimed to measure QoL associated with anxiety and depression in patients with chronic RHD.

2. Methods

Patients with RHD aged >18 years and both sex with at least one year of the duration of the disease were included in the study as case. For control group subjects with age >18 years, both male and female and without RHD were included. The patients were excluded if they were participating in other studies, suffering from other co-morbidities, and refused to participate in the study. Informed consent was obtained from both case and control.

2.1 Methodology

All the data was collected at the Department of Cardiology, Safdarjung Hospital, New Delhi during the period of February 2017 to June 2018. Subject HADS and SF-36 questionnaire were taken from the subjects for both case and control.

Subjects were studied for the RHD based on history, physical examination, and echo cardiogram.

Hospital Anxiety and Depression Scale (HADS)

The HADS is a self-reporting scale used to measure anxiety and depression in a general medical population of patients. It is simple and easy to use. The questionnaire comprises of seven questions for anxiety and seven questions for depression, and takes 2–5min to complete. Variables used for HADS consists of physical functioning, role limitations due to physical health, role limitations due to emotional problems, energy, emotional well-being, social functioning, pain, general health, and health change (Stern, 2014).

Short form 36 (SF 36)

The 36-Item Short Form Health Survey questionnaire (SF-36) is a very popular instrument for evaluating Health-Related Quality of Life. The SF-36 measures eight scales: physical functioning (PF), role physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role emotional (RE), and mental health (MH). Component analyses showed that there are two distinct concepts measured by the SF-36: a physical dimension, represented by the Physical Component Summary (PCS), and a mental dimension, represented by the Mental Component Summary (MCS). All scales do contribute in different proportions to the scoring of both PCS and MCS measures (Saris-Baglama RN et al., 2010).

2.2 Safety measures

Vital signs and electrocardiogram of the subjects were evaluated as a safety measure. Vital signs included health issues and other physiological issues, including heart rate and its activities.

2.3 Ethical considerations

The study was ethically approved from the Institutional Ethics Committee of Safdarjung Hospital, New Delhi to conduct the research. The data containing the names and disease history of all the patients involved in this study were kept highly confidential. All the clinical data and personnel files of the patients are only accessible to the study personnel to maintain the confidentiality and authenticity of the research. Informed consents were taken before the participation of the subjects.

2.4 Statistical analysis

Data were presented as frequency, percentage, mean, and standard deviation wherever applicable. Chi square test was used to compare Analysis of variance (ANOVA) was used to compare anxiety and depression categories across demographic and SF-36 domain. P value

<0.05 was considered significant. All the statistical analyses were performed by using IBM SPSS version 22.0 software.

3. Results

Five hundred patients with RHD after they followed inclusion criteria were included in the study. General characteristics of the patients have been shown in table 1. The patients' age ranged from 18 years to 75 years with a mean age of 35.77 years. 95.8% of the patients aged between 21 to 60years. Mean duration of treatment of RHD for the patients was 5.3±2.2 years. We observed that the majority of the patients (52.4%) were receiving the treatment between 5 to 8 years.

Table 1. General characteristics (n=500)

	n (%)
Age (Years)	
<20	18 (3.6%)
21-60	479 (95.8%)
>60	3 (0.6%)
Sex	
Male	271 (54.2%)
Female	229 (45.8%)
Duration of treatment (Years)	
<5	199 (39.8%)
5-8	262 (52.4%)
>8	39 (7.8%)

3.1 Anxiety and depression

Table 2 and Fig 1 show anxiety and depression in the patients and healthy controls. We observed that 87% of the patients had borderline to abnormal anxiety and 78.6% of patients had borderline to abnormal depression. Borderline to abnormal anxiety and depression was observed in 80% and 97% healthy controls respectively.

Table 2. Distribution according to anxiety score among cases and controls

Anxiety	Group	
	Cases	Controls
Normal	61	20
	12.2%	20.0%
Border Line	217	64
	43.4%	64.0%
Abnormal	222	16
	44.4%	16.0%
Total	500	100
	100.0%	100.0%

3.2 Association of sex with age, treatment of disease, anxiety, and depression

Table 3 shows the association of sex with age, treatment of disease, anxiety, and depression. We observed that age (P=0.228), treatment duration of disease (P=0.475), anxiety (P=0.879) and depression (P=0.215) were comparable between male and female groups.

Table 3. Association of sex with age, treatment of disease, anxiety and depression

	Male, n(%)	Female, n(%)	Total, n(%)	P Value
Age Group (Years)				
< 30	79 (29.2)	82 (35.8)	161 (32.2)	
30-40	96 (35.4)	85 (37.1)	181 (36.2)	
40-50	83 (30.6)	51 (22.3)	134 (26.8)	0.228
50-60	12 (4.4)	9 (3.9)	21 (4.2)	
> 60	1 (0.4)	2 (0.9)	3 (0.6)	
Duration of Treatment				
< 5 years	152 (56.1)	130 (56.8)	282 (56.4)	
> 5 years	119 (43.9)	99 (43.2)	218 (43.6)	0.475
Anxiety				
Normal	33 (12.2)	28 (12.2)	61 (12.1)	
Border Line	115 (42.4)	102 (44.5)	217 (43.4)	
Abnormal	123 (45.4)	99 (43.2)	222 (44.4)	0.879
Depression				
Normal	56 (20.7)	51 (22.3)	107 (21.4)	
Border Line	122 (45.0)	116 (50.7)	238 (47.6)	
Abnormal	93 (43.3)	62 (27.1)	155 (31.0)	0.215

3.3Association of Quality of life with anxiety and depression

The patients were also analyzed by the SF-36 questionnaire. It comprises of 36 items in 8 domains: Physical functioning, Role-physical functioning, bodily pain, general health, vitality, social functioning, role emotional functioning, and mental health.

The SF-36 generates a total score for each domain. The score is transformed into a value on a scale ranging from 0 to 100, where better health status is designated through a higher score value.

We observed that only pain variable was found to be a risk factor for anxiety (table 4), while none of the variables was associated with depression (table 5).

Table 4. Association of Quality of life with anxiety

		n	Mean	Std. Deviation	F-test
Age	Normal	61	35.72	9.694	0.987
	Border Line	217	35.15	9.259	p-value=0.374
	Abnormal	222	36.39	9.197	
	Total	500	35.77	9.285	
Gender	Normal	61	1.46	.502	0.128
	Border Line	217	1.47	.500	p-value=0.880
	Abnormal	222	1.45	.498	
	Total	500	1.46	.499	
Physical functioning	Normal	61	60.98	21.695	4.002
	Border Line	217	54.10	24.234	p-value=0.019
	Abnormal	222	51.91	20.148	
	Total	500	53.97	22.327	
Role limitations due to physical health	Normal	61	49.34	25.224	2.077
	Border Line	217	47.32	23.420	p-value=0.126
	Abnormal	222	43.54	24.309	
	Total	500	45.89	24.093	
Role limitations due to emotional problems	Normal	61	47.52	28.564	
	Border Line	217	46.87	29.449	1.299
	Abnormal	222	43.00	25.902	p-value=0.274
	Total	500	45.23	27.833	
Energy/fatigue	Normal	61	46.72	10.120	0.242
	Border Line	217	45.94	9.411	p-value=0.785
	Abnormal	222	45.83	8.050	
	Total	500	45.99	8.912	
Emotional well-being	Normal	61	48.16	9.709	2.102
	Border Line	217	50.67	9.935	p-value=0.123
	Abnormal	222	49.19	9.729	
	Total	500	49.71	9.839	

Social functioning	Normal	61	55.10	14.229	2.717
	Border Line	217	51.39	13.284	p-value=0.067
	Abnormal	222	50.53	13.652	
	Total	500	51.46	13.612	
Pain	Normal	61	54.07	20.036	5.856
	Border Line	217	51.20	18.011	p-value=**0.003***
	Abnormal	222	46.36	18.910	
	Total	500	49.40	18.847	
General health	Normal	61	46.64	9.024	0.335
	Border Line	217	47.48	7.677	p-value=0.716
	Abnormal	222	47.48	6.856	
	Total	500	47.38	7.496	
Health change	Normal	61	51.07	23.964	0.876
	Border Line	217	55.12	21.956	p-value=0.417
	Abnormal	222	53.13	23.778	
	Total	500	53.74	23.021	

Table 5. Association of Quality of life with depression

		n	**Mean**	**Std. Deviation**	**F-test**
Age	Normal	107	34.82	9.868	0.810 p-value=0.445
	Border Line	238	35.86	9.023	
	Abnormal	155	36.29	9.281	
	Total	500	35.77	9.285	
Gender	Normal	107	1.48	.502	1.540 p-value=0.215
	Border Line	238	1.49	.501	
	Abnormal	155	1.40	.491	
	Total	500	1.46	.499	
Physical functioning	Normal	107	56.87	24.711	1.152 p-value=0.317
	Border Line	23	53.26	21.812	

		8			
	Abnormal	15	53.06	21.338	
		5			
	Total	50	53.97	22.327	
		0			
Role limitations due to physical health	Normal	10	43.60	25.410	0.722
		7			p-value=0.486
	Border Line	23	46.97	23.034	
		8			
	Abnormal	15	45.81	24.788	
		5			
	Total	50	45.89	24.093	
		0			
Role limitations due to emotional problems	Normal	10	43.75	31.006	2.329
		7			p-value=0.098
	Border Line	23	47.97	26.355	
		8			
	Abnormal	15	42.05	27.499	
		5			
	Total	50	45.23	27.833	
		0			
Energy/fatigue	Normal	10	45.84	9.700	0.620
		7			p-value=0.538
	Border Line	23	46.43	8.957	
		8			
	Abnormal	15	45.42	8.276	
		5			
	Total	50	45.99	8.912	
		0			
Emotional well-being	Normal	10	49.82	9.859	0.042
		7			p-value=0.958
	Border Line	23	49.78	10.240	
		8			
	Abnormal	15	49.52	9.237	
		5			
	Total	50	49.71	9.839	
		0			
Social functioning	Normal	10	51.90	14.289	0.308
		7			p-value=0.735
	Border Line	23	50.96	13.362	
		8			
	Abnormal	15	51.93	13.575	
		5			
	Total	50	51.46	13.612	
		0			
Pain	Normal	10	53.22	19.475	2.951
		7			p-value=0.053
	Border Line	23	48.74	19.072	
		8			
	Abnormal	15	47.77	17.795	
		5			
	Total	50	49.40	18.847	
		0			

General health	Normal	107	47.48	8.561	0.489 p-value=0.614
	Border Line	238	47.05	7.193	
	Abnormal	155	47.81	7.187	
	Total	500	47.38	7.496	
Health change	Normal	107	53.04	21.476	0.172 p-value=0.842
	Border Line	238	54.37	23.380	
	Abnormal	155	53.26	23.608	
	Total	500	53.74	23.021	

4. Discussion

There is various availability of questionnaires which have been developed and validated to evaluate quality of life, data of QoL assessment in patients with RHD is scarce. RHD is a major burden in developing countries like India where it is one of the most common causes of cardiovascular morbidity and mortality in young people (Marijon et al., 2012).

Patients diagnosed with the disease experience severe difficulties due to complications caused by this disease such as atrial fibrillation (Diker et al., 1996), stroke, (Wolf, Abbott, & Kannel, 1991) and consequently often have problems in maintaining normal daily activities.

The present study demonstrated that quality of life in terms of pain and physical functioning was associated with anxiety while depression was not associated with quality of life in the patients with RHD. Patients with chronic RHD had been shown to have intellectual decline (Khalil, Mansour, & Attaia, 1998).

It has been reported that the patients with heart failure experience various physical and emotional symptoms such as dyspnea, fatigue, edema, sleeping difficulties, depression, and chest pain (Zambroski et al., 2005). These symptoms limit patients' daily physical activities and result in poor QOL (Rector, Anand, & Cohn, 2006). Bodily pain is one of the major manifestations of rheumatic fever that lead to sleeping difficulties in patients. Although heart diseases cause a significant impact on physical health from the medical point of view (Guyatt, 1993), most studies on quality of life also reported low scores in the psycho social aspects (DeMaso et al., 2004; Ruo et al., 2003). Adolescents with severe heart disease reported a higher level of anxiety and depression as compared to the age-matched healthy controls (Cohen et al., 2007).

Study on QoL in adults with congenital heart diseases showed that inoperable conditions had a trend towards a poorer quality of life (Varni, Limbers, & Burwinkle, 2007). Lane et al. (2002)

showed that arthritis and RHD negatively affected several sides in QoL, such as the work, and home activities compared to individuals without chronic disease. Regarding cognitive problems, it was observed that individuals with rheumatic fever may exhibit profound reversible cognitive problems, such as poor attention and concentration (Carapetis, 2008).

In our study, QoL was not associated with depression. However, a study suggested that depressed patients with cardiac heart failure (CHF) scored significantly worse than non-depressed patients on all components of Kansas City Cardiomyopathy Questionnaire measuring quality of life. Depressed CHF patients may perceive their quality of life to be lower and to underestimate their functional status.

Depression is less investigated in association with quality of life in cardiac disease (Gottlieb SS et al., 2004). Severity of anxiety has also suggested in the patients with osteoporosis and chronic breathing disorders (Kunik et al., 2005; Martino et al., 2018).

The findings also conclude an association between physical functioning, role physical functioning, bodily pain, general health, vitality, social functioning, role emotional functioning and mental health with anxiety and depression among the RHD patients. Therefore, anxiety and depression may be considered as a co-morbid effect of RHD, especially in economically backward patients. This implies that the patients generally belonging to the middle class or low-income families with RHD are impacted by anxiety and depression. Anxiety and depression in patients with Chronic RHD are therefore inter-related.

The current study had a few limitations as well. We used the English version of the SF36 questionnaire, and more than 90percent of our patients could not understand it and were unable to answer, so we had to take direct interviews afterward.

The data collected was from the patients of north region only, so we didn't know if the different region and environment will have the same effect.

5. Conclusion

RHD is associated with a lower quality of life in patients. Anxiety and depressions in patients with RHD are associated with external and internal conditions. External conditions include work life, personal life, financial issues, and others, while the internal issues include co-morbid health condition and prolonged diseases. Anxiety and depression in patients with Chronic Rheumatic heart disease are inter-related with the quality of life.

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