ORIGINAL ARTICLE

Psychosocial Risk Factors Related with Cardiovascular Disease in Pakistani Population

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ABSTRACT

Aim: To enlist the psychosocial risk factors related with cardiovascular disease.
Study design: Prospective study
Place and duration of study: Department of Cardiology, Loralai Medical College & Hospital, Loralai from 1st January 2021 to 30th June 2021.
Methodology: One hundred and twenty patients of cardiovascular diseases were enrolled. Through a well-structured questionnaire psychosocial stress was measured in terms of grading's and scores. Socio-demographic details were recorded.
Results: The majority of patients were females with a mean age of the patients were 54.2±4.5 years. Stress level for the loss of loved ones at moderate grade was 56.6% and severe stress by 37.5% of patients for the same. There were 13.3% widow or divorced who felt severe stress related to their marital status and 58% had low grade stress associated with their job.
Conclusion: Loss of loved ones, marital stress, financial and job related stress are the main psychosocial factors identified as major risk of cardiovascular disease.
Key words: Psychosocial factors, Stress, Cardiovascular diseases

INTRODUCTION

Stress and depression plays a pivotal role in the development and progression of cardiovascular disease (CVD)[1]. Exact relation of psychological factors with cardiovascular diseases is not known as compared with other factors such as hypertension, diabetes, smoking, high cholesterol levels and obesity[1-4]. In stress and depression, high levels of cortisol forms in the body, alters the normal levels of cholesterol, blood sugar, triglycerides and blood pressure. These changes also provoke plaque formation inside the arteries.[5] Several studies reported association of CVD and stress through various direct or indirect pathways[4,6-8] and revealed that incidence of coronary heart diseases get elevated upto 1.6 folds in association with CVD[9,10].

Stress can cause elevated risk of cardiovascular comorbidities along with different sorts of physical discomforts. The results of large retrospective study (52 countries) highlight that long term stress is associated with elevated risk of myocardial infarction even after counselling sessions from psychiatrists and controlling their health problems.[7] Ways through which stress can handle can also put significant impact on heart health such as smoking, unhealthy dietary habits and sedentary lifestyle. Findings from developing part of the world showed strong interrelation of CVD with chronic stress, majority of which cause mortality.[11,12]

Cardiovascular mortalities are a major burden on low income countries. Data on the association of cardiovascular diseases and psychological stress is limited from low income or developing countries of the world.

Purpose of this study was to highlight the role of stress in cardiovascular diseases from Pakistan. Stress was stratified in different groups (education, financial, related to jobs) and their association with incidence of CVD was determined.

MATERIALS AND METHODS

This prospective study was performed at Department of Cardiology, Loralai Medical College/Teaching Hospital Loralai from 1st January 2021 to 30th June 2021 and after permission from IRB 120 patients were enrolled. Each enrolled participant was assessed for their permission before their enrolment in the study. Patients >35 years having recent cardiovascular disease were included in the study. Patients having older history of

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cardiovascular diseases or incomplete baseline data were excluded as study participants. Each patient's socio-demographic information and measurements of stress were recorded on a well-designed Performa. The stress measurements were made by dividing it into psychological, financial and lifestyle/events stress. Two single item questionnaires were applied for assessing the psychosocial stress at work or home. Stress definition was based on feeing irritated or anxiety filled or and having difficulty in sleeping. The question of stress was asked by categorizing stress into various scores from mild to severe. Here grade 1 meant no stress, 2 meant single episode of stress (both scored as 0), 3 meant several episodes (scored as 1) and 4 meant permanent stress (scored as 2). Stress related with life events included whether they had ever felt stress by loss of job, business failure, illness, relative death or any other adverse events. Financial stress was defined as past 12-month stress due to deprived financial state or loss. This was categorized as no/mil stress or moderate/high stress. A complete scoring was measured by sum up of all stress where 0-3 category was taken as no stress, 1 as low stress, 2 as moderate and 3 as severe stress score. Obesity and heath related stress were also calculated. Data was analyzed by SPSS version 25.

RESULTS

There were 120 study participants with 57.5% females and 42.5% males in this study with their age between 36-72 years. The mean age of the patients was 54.2±4.5 years. Majority of the patients were between 47-57 years (Table 1).

Table 1: Distribution of gender and age among study population (n=120)

Variable	No.	%
Gender		
Male	51	42.5
Female	69	57.5
Age (years)		
36-46	12	10.0
47-57	62	51.6
58-68	40	33.4
>68	6	5.0

Psychosocial stress was highest in low grading in uneducated patients while severe levels was find in 15.5% college or university educated students. Around 43.7% primary educated patients felt no stress related to their educational level (Table 2).

The present study also showed that job related stress was graded low (48.3%) in majority of the patients followed by

moderate stress level for the loss of loved ones (56.6%). Out of the composite stress severe stress was faced by majority (37.5%) of patients due to loss of their loved ones (Fig. 1).

Furthermore, the present study also measured marriage related stress in all of the patients elaborating that 47.27% married and 60% unmarried patients felt no stress due to their marital state. However, 7.27% married and 13.3% divorced or widowed

patient had high level of stress related to their marital rank. There were 42.6% and 44.7% such patients who were having no stress related of the area urban or rural where they lived in respectively where as 21.95% and 15.7% were those who felt moderate stress due to their urban or rural lifestyle respectively (Table 3).

Table 2: Distribution of educational related stress in study population

Educational stress	Scoring and Grades			
	0 as none	1 as low	2 as moderate	3 as high
None (n=10)	3 (30%)	4 (40%)	2 (20%)	1 (10%)
Primary (n=16)	7 (43.75%)	4 (25%)	3 (18.75%)	2 (12.5%)
Secondary (n=49)	25 (51.025)	15 (30.6%)	6 (12.2%)	3 (6.12%)
College/university (45)	18 (40%)	12 (26.6%)	10 (22.2%)	7 (15.5%)

Table 3: Distribution of marital and area related stress in study population

Variable	Scoring and Grades			
	0 as none	1 as low	2 as moderate	3 as high
Marital status				
Married (n=55)	26 (47.27%)	12 (21.8%)	8 (14.54%)	4 (7.27%)
Unmarried (n=5)	3 (60%)	2 (40%)	1 (20%)	-
Divorced/widow (n=60)	15 (25.5%)	20 (33.3%)	17 (28.3%)	8 (13.3%)
Area related stress				
Urban (n=82)	35 (42.6%)	21(25.60%)	18 (21.95%)	8 (9.7%)
Rural (n=38)	17 (44.7^)	11(28.9%)	6 (15.7%)	4 (10.5%)

Fig. 1: Stress related to job, heath and financial events in study population
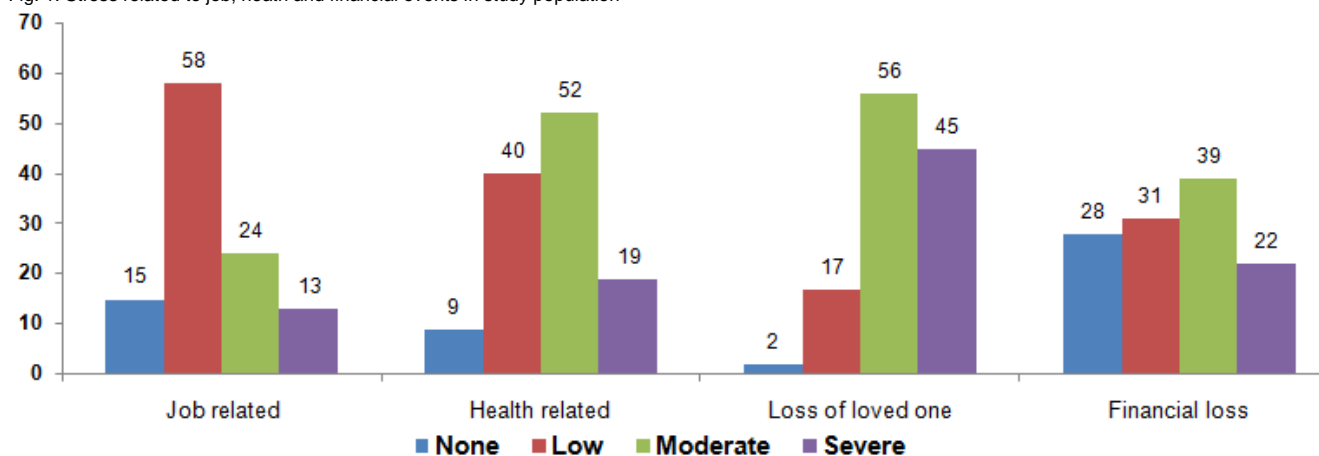
DISCUSSION

Social determinants related to health were related with high prevalence of cardiovascular morbidities and mortalities, worldwide. Various risk factors for cardiovascular diseases is already well documented. Result of large prospective study showed significant interrelation between elevated chances of CVD, mortality and stroke with adverse psychosocial factors.[13,14] Individual stress response may vary due to prior life experiences and other factors for instance; genetic factors, psychological coping and resilience.[15] Potential explanation of high mortality rate is how the person respond and copes with that particular stress.

Mechanism through stress influence cardiovascular diseases are still complex but it is often measured and relates with deleterious behaviors like smoking, dietary habits, alcohol consumption, lack of exercise that might increase the likelihood of cardiovascular diseases, stroke and death.[17,18] Underlying mechanism may involve sympathetic nervous system activation, neuroendocrine, immunologic, hypothalamus-pituitary-adrenal axis, as well as interaction of environmental and genetic factors[1].

Psychosocial variables are difficult to explain because there is no definite parameter or consensus on how stress can be measured[3,10]. Perceived stress level of the same factor or exposure may also vary from person to person due to other

factors. Perception of stress and anxiety level also varies across different geographical region, ethnic groups and person's own socio-economic level. In present study, stress due to loss of loved one was found in majority of the participants in accordance with other study.[16] This study also highlights that females were more stressed as compared to males. Hence, it is important to develop assessment tool for measuring stress across different countries.

CONCLUSION

There is dire need of developing measuring tool for assessing psychosocial stress level. Healthy dietary patterns, exercising regularly, adequate sleep, maintaining a healthy weight and social interaction helps in managing stress and lessen the chances of CVD. Loss of loved ones, marital stress, financial and job related stress are the main psychosocial factors identified as major risk of cardiovascular disease.

Conflict of interest: Nil

REFERENCES

1. Backé EM, Seidler A, Latza U, Rossnagel K, Schumann B. The role of psychosocial stress at work for the development of cardiovascular diseases: a systematic review. Int Arch Occup Environ Health 2012;85(1):67-79.

2. Dimsdale JE. Psychological stress and cardiovascular disease. J Am Coll Cardiol 2008;51(13):1237-46.
3. Steptoe A, Kivimäki M. Stress and cardiovascular disease: an update on current knowledge. Annu Rev Public Health 2013; 34:337-54.
4. Kivimäki M, Steptoe A. Effects of stress on the development and progression of cardiovascular disease. Nat Rev Cardiol 2018;15(4):215-29.
5. Gawlik KS, Melnyk BM, Tan A. Associations between stress and cardiovascular disease risk factors among million hearts priority populations. Am J Health Promotion 2019; 33(7): 1063-6.
6. Denollet J, Schiffer AA, Spek V. A general propensity to psychological distress affects cardiovascular outcomes: evidence from research on the type D (distressed) personality profile. Circ Cardiovasc Qual Outcomes 2010; 3(5):546-57.
7. Rosengren A, Hawken S, Ounpuu S, et al. INTERHEART investigators. Association of psychosocial risk factors with risk of acute myocardial infarction in 11119 cases and 13648 controls from 52 countries (the INTERHEART study): case-control study. Lancet 2004; 364(9438):953-62.
8. Vahedian-Azimi A, Moayed M. Updating the meta-analysis of perceived stress and its association with the incidence of coronary heart disease. Int J Med Rev 2019;6(4):146-53.
9. Lightbody CE, Clegg A, Patel K, et al. Systematic review and meta-analysis of psychosocial risk factors for stroke. Semin Neurol 2017;37(3):294-306.
10. Dar T, Radfar A, Abohashem S, Pitman RK, Tawakol A, Osborne MT. Psychosocial stress and cardiovascular disease. Curr Treat Options Cardiovasc Med 2019;21(5):23.
11. Lemstra M, Rogers M, Moraros J. Income and heart disease: neglected risk factor. Canad Fam Phys 2015; 61(8): 698-704.
12. Rosengren A, Smyth A, Rangarajan S, Ramasundarahettige C, Bangdiwala SI, AlHabib KF, et al. Socioeconomic status and risk of cardiovascular disease in 20 low-income, middle-income, and high-income countries: the Prospective Urban Rural Epidemiologic (PURE) study. Lancet Global Health 2019; 7(6): e748-60.
13. Kivimäki M, Kawachi I. Work stress as a risk factor for cardiovascular disease. Curr Cardiol Rep 2015;17(9):630-39.
14. Richardson S, Shaffer JA, Falzon L, Krupka D, Davidson KW, Edmondson D. Meta-analysis of perceived stress and its association with incident coronary heart disease. Am J Cardiol 2012; 110(12):1711-6.
15. Steptoe A. Psychophysiological contributions to behavioral medicine and psychosomatics. In: Cacioppo T, Tassinary L, Bernston G, eds. The Handbook of Psychophysiology. 3rd ed. Cambridge University Press; 2007.
16. Salleh MR. Life event, stress and illness. Malays J Med Sci 2008;15(4):9-18.
17. Hamer M, Molloy GJ, Stamatakis E. Psychological distress as a risk factor for cardiovascular events: pathophysiological and behavioral mechanisms. J Am Coll Cardiol 2008;52(25):2156-62.
18. Das S, O'Keefe JH. Behavioral cardiology: recognizing and addressing the profound impact of psychosocial stress on cardiovascular health. Curr Hypertens Rep 2008;10(5):374-81.