PSYCHOLOGICAL FACTORS AND CARDIOVASCULAR DISEASE

For the partial fulfilment of the

Bachelor Degree of Cardiovascular Technology

STUDENT NAME

Saumya Kaushik

SUPERVISOR NAME

DR SONAM KUMARI

Assistant Professor

Division of Cardiovascular Technology

Galgotias University

DIVISION OF CARDIOVASCULAR TECHNOLOGY

SMAS

GALGOTIAS UNIVERSITY

GREATER NOIDA

U.P

2018-2022

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I, Saumya kaushik certify that the work embodied in this Project work is my own bonafide work carried out by me under the supervision of Dr Sonam Kumari for a period of **1 YEAR** from **2021** to **2022** at Galgotias University. The matter embodied in this thesis has not been submitted elsewhere for the award of any other degree/diploma. I declare that I have faithfully acknowledged, given credit to and referred to the research worker wherever the work has been cited in the text and the body of the thesis. I further certify that I have not wilfully lifted up some other's work, para, text, data, results, etc. reported in the journals, books, magazines, reports, dissertations, theses, etc., or available at web-sites and have included them in this CVT Project / Desertion / thesis and cited as my own work.

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Place: **Galgotias University**
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This is to certify that the research project / thesis entitled "Psychological Factors and Cardiovascular Disease**"** Submitted by **SAUMYA KAUSHIK** Reg. NO 18SMAS1040009at Galgotias University for the Bachelor degree in **CARDIOVASCULAR TECHNOLOGY** is his/her original research work carried out by him/her under my guidance and supervision. This work is fully or partially has not been submitted for the award of any other degree or diploma. The assistance and help taken during the course of the study has been duly acknowledged and the source of literature amply recorded.

Supervisor signature:

Dr Sonam Kumari
Supervisor Name:
Supervisor Designation:
Assistant professor
Division of Cardiovascular Technology
SMAS
Galgotias University
Greater Noida
U.P INDIA

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Signature of the student
Saumya kaushik

List of graph and table

List of Aberration used in this Desertion / project/ thesis report

1. CAD : Coronary Artery Disease

2. CVD : Cardiovascular Disease

3 CHD : Coronary Heart Disease

4 AMI : Acute Myocardial Infarction

Abstract

Currently most of the studies on CVD are mainly focused on the physical problem and life style, some evidences have points up that psychological factors have a very important role in the cardiovascular disease.

Recent studies provide clear evidence that psychological activity deals with cardiovascular disease (CVD). The present study aimed to review association of psychological factors, such as depression, anxiety, stress, and hostility, and in many ways affect the heart's physiology.

Introduction

Although most of the studies on CVD are mainly focused on the biological risk factors and life style, some evidences have revealed that psychological factors have a very important role in the cardiovascular disease.

Poor socio-economic status, lack of social support, stress at work and at home, anxiety disorders and depression have been shown to increase the risk of developing CVD. These factors are also associated with poor outcomes in patients with established cardiovascular disease. Cardiovascular disease is a complex, multifactorial phenotype.

The purpose of this paper is to review association of psychological factors such as depression, anxiety disorder and stress with CVD.

Review of Literature

A literature search was carried out using Medline/PubMed, Embase, Scopus, Web of Science and Cochrane Central Register of Controlled Trials (CENTRAL) databases from inception to 2 June 2022. Articles in English were included in the research. Database searches were performed using the following keywords: ‘coronary artery disease’ and its synonyms (CAD), coronary vascular disease (CVD), coronary plaque, coronary heart disease (CHD). References cited in the articles were manually checked.

Hypothesis of research

Null Hypothesis.

Methodology

The present study aimed to review association of psychological factors with CVD.

Study design, participants, and data collection

This study was a single-centre retrospective analysis of all patients > 18 years of age who were admitted to Rajiv Gandhi Hospital, Delhi, an urban tertiary care hospital, from 1 March to 24 April 2022. Patients included had a confirmed diagnosis of CVD. They were then classified according to the presence of psychological issues vs those without psychological issues. Demographic and clinical data, comorbidities, outcomes, and laboratory findings were obtained for this study.

Statistical analysis

Demographic variables were presented using descriptive statistics and frequencies. Categorical variables were analysed with Chi-square testing. Independent T test was used for continuous variables. Multivariate logistic regression analysis was used to evaluate the factors associated with mortality in the overall sample population of patients were used and are presented when appropriate. All analyses were performed using IBM's SPSS Statistics for Windows, Version 23.0.

Result

This study showed that psychological factors play an important role in CVD as protective or risk factors. The main ones are depression, anxiety and stress. The results of these studies are anxiety, stress, and lack of social support and psychological work characteristics associated with B. coronary artery disease.

People with depression have a 64% higher risk of developing CHD than people without depression.

One of the most important protecting factors for CHD is social support. Several studies have shown that the social support perceived during hospitalization reduces depressive symptoms in the months that follow.

The study also revealed different types of stress, including anxiety, depression, social isolation, social support, acute and chronic life events, hostility, and type A behaviour. Of these variables, social support is more important than the other variables. Lack of social support is not only associated with the development of CHD, but is also an independent risk factor for mortality.

Discussion

1. DEPRESSION

Depression and anxiety as major disorders leading to increased cardiovascular events, readmissions, and mortality in coronary patients.[1]

Depression is a risk factor for morbidity and mortality in patients with coronary artery disease, especially after acute coronary syndrome.[2]

Atherosclerosis may even promote depressive symptoms before clinical CAD symptoms.[3]

Substantial evidence indicates that depression has both behavioural and direct pathophysiological effects. From a behavioural mechanism perspective, depression is associated with both unhealthy lifestyles such as smoking and poor patient compliance. [4,5] The direct pathophysiological effects of depression include at least three mechanisms. First, depression is associated with hypercortisolaemia. [6,7] Related findings include diminished response of adrenocorticotropic hormone to adrenocorticotropic hormone-releasing factor administration, non-suppression of cortisol secretion after adrenocorticotropic administration, and adrenocorticotropic stimulation. Includes an increase in hormone release factor levels. Cerebrospinal fluid in depressed patients.

[8] Second, people with depression can develop serious impairments in platelet function, such as increased platelet reactivity and the release of platelet products such as platelet factor 4 and Beta-thromboglobulin. [9,10] The combination of hypercortisolaemia and improved platelet function supports the rationale for explaining the atherosclerotic effect of depression. In addition, decreased heart rate variability and impaired vagal control have been reported in patients with depression. These findings suggest that patients with depression may also be more likely to be arrhythmogenic.

2. ANXIETY

Evidence suggests that anxiety unrelated to depression adversely affects the prognosis of CVD patients, but the role of anxiety as a risk factor for etiology is less clear. Supports, psychological factors, especially the physiological pathways of the relationship between anxiety and CVD.[11]

CVD patients' psychological anxiety symptoms were found to correlate with physical factors such as palpitation when anxiety was not exercising, facial anger and facial red tide, abnormal heartbeat, and muscle tension.

The relationship between fear and sudden death. It suggests that ventricular arrhythmias may be the mechanism of cardiac death in people with anxiety disorders. It was observed that people with anxiety disorders had reduced heart rate variability[12]. Therefore, there may be pathological changes in the autonomic tone of the heart. This change may include increased

sympathetic stimulation associated with the development of arrhythmias and sudden death, or impaired vagal control associated with increased cardiac arrest. Regarding the latter possibility, there is a decrease in vagal control. It is associated with impaired pressure reflex control of the heart via the vagus nerve. Such disorders appear to be a particularly important risk factor for sudden death [13,14].

3. STRESS

Variables that are commonly regarded as components of stress include: depression and anxiety, social isolation and lack of support, tragic life events, psychosocial work characteristics, and hostility and type A behavior.[15]

Loneliness is also one of the important risk factors for patients with heart failure, and the more the patients feel lonely the more is chances CHD. [16]

Acute and chronic psychological stress are associated with acute coronary syndromes (ACSs).[17]

Psychosocial working characteristics such as high job demand, low decision latitude, or job pressure are associated with increased levels of CVD risk factors.[18]

4. TYPE-A BEHAVIOUR & HOSTILITY

Early research data indicated that type A behavior pattern, which is primarily characterized by hostility, ambitions, competitive habits, constantly preoccupied with deadlines, and a sense of urgency, was related to the development of CVD. [19]

Studies on American and European populations have demonstrated that high levels of anger and hostility are predictive of coronary heart disease (CVD) mortality.[20]

A recent Japanese study pointed that higher levels of hostility increased the risk of acute myocardial infarction (AMI).[21]

5. SOCIAL ISOLATION AND LACK OF SUPPORT

Like other psychosocial factors, social support influences the extent to which individuals engage in such high-risk behaviours as smoking, fatty diet intake, and excess alcohol consumption. In addition, social factors may exert direct pathophysiological effects, including hypercortisolaemia. Animal studies have reported an association between social isolation and hypercortisolaemia [22,23] and reversible increases in resting heart rates among cynomolgus monkeys, depending on the presence or absence of social separation. Similarly, human studies have demonstrated an inverse relationship between the quality of social relationships and urinary levels of epinephrine[54] and between the degree of social support and raising heart rates. Elevated resting heart rates may constitute a sign of altered autonomic

arousal. The presence of social support may also attenuate blood pressure and heart rate responses to stressful stimuli in humans.[24,25] In summary, these data suggest that social factors promote atherogenesis through activation of the autonomic nervous system.

Conclusion

This study dealt with this topic using a modern psychological perspective aimed to evaluate the role of psychological factors in the CVD. The findings of this study showed that although psychological factors are independent risk factors for CVD. It is necessary that more attention be paid to psychological factors and preventive actions towards CVD. Without doubt, performing psychological and educational promotions in the community and increasing people's awareness about the psychological factors of CVD can have an effective role in promoting the people's heart as well as on the overall health in the future.

Conflict of interest:

There are no conflicts of interest

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