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NEUROTICISM AND CORONARY ARTERY DISEASE

Surgery

Niyati Kar Principal, Sister Nivedita University Nursing Institute, Newtown, Kolkata

Santanu Dutta Associate Prof, Dept of CTVS, IOGMER, Kolkata

Sadhan Dasgupta Retired professor & HOD, Dept of Psychology, CU

U. N. Sarkar HOD & Prof, Dept of CTVS, IPGMER, Kolkata

ABSTRACT

Introduction: Cardiovascular diseases are one of the most prominent health issues of the twenty first century and the most common cause of death worldwide. Second half of the 20th century has witnessed a global spread of the coronary artery disease (CAD) especially in developing countries, including India. **Aims:** The aim of the study was to find out whether there is any relationship between Coronary Artery Disease and psychological variables namely personality. **Materials and Methods:** The study has been conducted at - CTVS Dept. and Cardiology Dept. in SSKM Hospital, Kolkata, West Bengal and General population from the community as well as individuals accompanied the patient for matched control group. **Result:** In present study there was statistically significant difference between the groups in terms of neuroticism dimensions of personality and CAD but computation of correlation between CAD and neuroticism scores statistically was not significant. **Conclusion:** Pearson's correlation coefficient was computed between individual personality dimensions to reveal the correlation within components of dimensions of personality of individual with one another from the available data, though it was not the objective of the investigator. The findings of the result have been annexed for future researchers.

KEYWORDS

coronary artery disease, Pearson's correlation, and dimensions.

INTRODUCTION

Cardiovascular diseases are one of the most prominent health issues of the twenty first century and the most common cause of death worldwide. Second half of the 20th century has witnessed a global spread of the coronary artery disease (CAD) especially in developing countries, including India. WHO predicted that this trend has been to continue until 2020. In India in the past five decades, rates of coronary disease among urban populations have risen from 4 per cent to 11 per cent. The urban Indians are more vulnerable to CAD, may be due to different nutritional, environmental, and life-style factors. The endothelial dysfunction is likely to be multifactorial in these patients, also risk factors personality and life-style has a great role in this aspect. From the Global Burden of Disease study, it is revealed that age-standardized CVD death rate of 272 per 100 000 populations in India is quite high than the global average of 235 per 100 000 populations. In India premature mortality in terms of years of life lost from CVD increased by 59%, from 23.2 million (1990) to 37 million (2010). Though there is wide heterogeneity in the prevalence of CVD risk factors in different regions, but it has emerged as one of the leading cause of death in all over India including poorer states and rural areas. (Prabhakaran et al.2016)[1].

The connection between the mind and the body is nothing new to those involved in the medical practice. Personality, anger, depression, anxiety etc. are the terms that represent variety of emotional states, have been proven to adversely affect the immune system. Chronic repressed emotions and personality pattern can make a person more susceptible to diseases and distress.

Type A personality behavior was first described as a potential risk factor for heart disease in the 1950s by cardiologists Meyer Friedman and Ray Rosenman. After an eight and a half yearlong study of healthy men between the ages of 35 and 59, Friedman and Rosenman estimated that Type A behavior doubles the risk of coronary heart disease in otherwise healthy individuals. Main features of Type 'A' personality is competitive, ambitious, impatient, aggressive, fast-talking in nature.

Previous research findings suggested that chronic repressed emotions and personality pattern can make a person more vulnerable to diseases and distress.

Psychological interventions and coronary heart disease have shown that psychological ill-being to be a strong and independent risk factor for both the development and worsening and prognosis of coronary heart disease. However, little is known of mechanisms by which these factors contribute to the increased risk.

The result of a review article on the impact of emotion on coronary heart disease risk (Tennant C, et al. 2001)[3] revealed the empirical evidences linking emotional disturbances such as anxiety, depression and anger to coronary heart disease was robust. There is also increasing evidences for the underlying pathophysiology that may link emotions to coronary heart disease.

OBJECTIVE

- To find out whether the patients suffering from CAD differ significantly from a matched control group with reference to their personality pattern.
- To determine whether there is relationship between CAD and dimensions of personality.

MATERIALS AND METHODS

Venue of the study:

The study has been conducted at -
CTVS Dept. and Cardiology Dept. in SSKM Hospital, Kolkata, West Bengal and General population from the community as well as individuals accompanied the patient for matched control group.

Inclusion Criteria For Study Group:

- CAD patients attending tertiary hospital in CTVS Department and Cardiology Department
- Confirmed diagnosis of CAD done by doctors by angiography and written on OPD Tickets
- Available during the study period
- Willing to participate in the research study
- Can read and write Bengali/English or both
- Within the age group of 31-70 years

Inclusion Criteria For Control Group:

- Matched in relation to age, sex, educational background, dietary habit etc.
- Available during the study period
- Willing to participate in the research study

Exclusion Criteria For Study Group And Control Group:

- Not matched in relation to age, sex, educational background, dietary habit etc.
- Not willing to participate in the research study
- Not be available during the study period

Description of Tools

Tool 1: A set of semi-structured questionnaire was developed to collect demographic data of the sample.
Tool 2: NEO-Five Factor inventory (Neo-FFI)

Description of the test
NEO-5-Factor inventory is standardized tool, developed by Paul T. Costa, and Rbert R. McCrae, consists of 60 items that provides a brief

and comprehensive measure of the five domains of personality. There is no time limit for the NEO-FFI. Most respondents require 10-15 minutes to complete it but for older respondents and those with limited reading skills may take longer time. The names, number of items and domains of personality measured by each are described below:

Neuroticism (N): A 12 item scale that measures neuroticism domain of personality of an individual. It is concerned with the level of emotional adjustment. People with high neuroticism tend to experience negative effects such as guilt, anger, embarrassment, fear, sadness and disgust. They are susceptible to psychological distress, are prone to irrational ideas, less able to control their impulses and cope more poorly than others with stress. Individual scoring high on this scale may be at risk for some kind of psychiatric problems. Individuals who score low on neuroticism are emotionally stable. They are usually calm, even-tempered and relaxed. They are able to face stressful situations without becoming upset or rattled.

Expression (E): This is a 12-item scale. Individual scoring high in this scale extraverted, outgoing, active and high spirited. They generally prefer to be around people most of the time. It is correlated with interest in enterprising occupations (Costa et al, 1984). Individual scoring low on this scale tend to be reserved, independent, and even-spaced and prefer to be alone. Though they lack exuberant high spirits, they are not unhappy or pessimistic.

Openness (O): This is a 12-item scale. These include active imagination, aesthetic sensitivity, attentiveness to inner feelings, preference for variety, intellectual curiosity and independence of judgement. It is especially related to divergent thinking and creativity (McCrae, 1987). Individual scoring high on this scale are open to new experiences. They generally have broad interests and are very imaginative. Individual scoring low on this scale are conventional and conservative, prefer the familiar to the novel.

Agreeableness (A): This is a 12-item scale. Individual scoring high on this scale are compassionate, good natured and eager to cooperate and avoid conflict. Individual scoring low on this scale are hard headed, sceptical, proud and competitive. They generally tend to express their anger directly.

Conscientiousness (C): This is a 12-item scale. Individual scoring high on this scale are conscientious and well organized. They have high standards and always try to achieve their goals. It is correlated to academic and occupational achievements. Individual scoring low on this scale are easy going, not very well organized and sometimes careless. They prefer not to make plans.

RESULT AND DISCUSSION

The present study investigated whether the patients suffering from CAD statistically differ significantly from a matched control group with reference to some psychological variables namely different dimensions of personality. Also, whether there was any relation between coronary artery disease (CAD) and those different dimensions of personality.

Speculations about the link between psychosocial factors and cardiovascular disease are almost as old as medicine itself.

To combat cardiovascular disease (CVD), physicians and allied health care professionals often focus on modifying conventional risk factors such as smoking, hypertension, hypercholesterolemia, and diabetes. An escalating body of research provides strong evidence for the adverse effects of psychosocial factors in the development of CAD and in the prognosis of patients with CAD.

Major findings of the present study:

The major findings of the study were as follows --

- Result of Student's unpaired t test between the control and the experimental groups showed statistically significant difference between the groups in terms of Neuroticism dimension ($p < 0.001$) of personality.
- This indicates that the control and the experimental groups differ significantly in terms of Neuroticism traits and that the experimental group shows more traits of Neuroticism than control group.
- According to objective of the study correlation computed between the psychological test score and CAD score of study group. For all components of different dimensions of personality, the correlation was poor. Neither was hypothesis test for correlation significant at p level < 0.05 for any dimension of personality.

Discussion In Relation To Other Studies

In present study there was statistically significant difference between the groups in terms of neuroticism dimension of personality and CAD but computation of correlation between CAD and neuroticism scores statistically was not significant.

- Almas, A., et. al (2017) published a study on Effect of neuroticism on risk of cardiovascular disease in depressed persons - a Swedish population-based cohort study. Result of the study revealed that Neuroticism increased the risk of CVD. In the present study Neuroticism trait was reported significantly high in experimental group than in control group. But the computation of correlation between neuroticism and CAD did not show statistical correlation between the two.

CONCLUSION

The score of psychological variables assessed in 810 subject (Study group N=405, Control group N=405). Student's unpaired t test results revealed significant group difference in respect of neuroticism dimensions of personality between the study & control groups. The psychological scores of CAD patients were correlated with angiographic score. The result was found not to have significant relation with CAD. It was concluded that this trait may have some role in the pathogenesis of coronary artery disease, also affects the consequences of CAD as there was significant group difference which was discussed above.

Pearson's correlation coefficient was computed between individual personality dimensions to reveal the correlation within dimensions of personality of individual with one another from the available data, though it was not the objective of the investigator. The findings of the result have been annexed for future researchers.

Table: Demographic profile frequency and percentage distribution of study and control group by blood pressure and body mass index

Sl. no	Variables	Characteristics	Study group		Control group	
			Frequency	Percentage	Frequency	Percentage
1	Blood pressure (Systolic)	90- 110 mm of mercury	84	20.74	78	19.26
		111- 130 mm of mercury	171	42.22	243	60
		131- 150 mm of mercury	96	23.7	54	13.33
		151- 170 mm of mercury	36	8.89	27	6.67
		171- 190 mm of mercury	18	4.44	3	0.74
2	Blood pressure (Diastolic)	71- 80 mm of mercury	141	34.81	189	46.67
		81- 90 mm of mercury	105	25.93	90	22.22
		91- 100 mm of mercury	42	10.37	3	0.74
		60- 70 mm of mercury	117	28.89	123	30.37
3	Body mass index	18.5 – 24.9	231	57.04	270	66.67
		25- 29.5	114	28.15	105	25.93
		30 and above	24	5.93	21	5.19
		<18.5	36	8.89	9	2.22

Table: Comparison of numerical variables of different dimensions of Personality between Case (n = 405) and Control (n = 405) groups – Student's unpaired t test

	Mean ± SD		t-value	df	P
	Case	Control			

N(Neuroticism)	24.09 ± 5.343	22.59 ± 6.028	3.763	808	< 0. 001
E(Expression)	26.72 ± 5.818	26.25 ± 4.813	1.25	808	0.212
O(Openness)	21.58 ± 4.925	21.39 ± 4.396	0.565	808	0.573
A(Agreeableness)	27.38 ± 5.512	27.5 ± 5.17	-0.309	808	0.757
C (Conscientiousness)	29.42 ± 5.919	28.67 ± 5.33	1.903	808	0.057

Correlation between CAD with few selected psychological variables

Spearman's rank correlation coefficient Rho

	Valid n	Spearman's Rho coefficient	p-level
CAD & Person_N	405	0.025	0.619
CAD & Person_E	405	– 0.029	0.567
CAD & Person_O	405	0.021	0.681
CAD & Person_A	405	0.068	0.172
CAD & Person_C	405	0.015	0.768

Table shows correlation between the different dimensions of personality with CAD scores in the experimental group. The correlations were mostly poor. Neither was hypothesis test for correlation significant at p level < 0.05 for any of the dimensions.

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