

PSYCHOLOGICAL FACTORS IN CORONARY HEART DISEASE

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SYNOPSIS

This is a psychological investigation on 58 consecutive coronary heart disease patients and 58 matched healthy controls for Type A behaviour, Eysenck's personality dimensions — extraversion and neuroticism, and Holme and Rahe's life events. The results showed that there were more Type A behaviour among the CHD patients (17 cases) than the controls (5 cases). The CHD patients also scored slightly higher on neuroticism and scored twice as much on the life event scale. They smoked more but drank less. It is concluded that psycho-social factors do play a role in the aetiology of coronary heart disease.

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INTRODUCTION

The coronary-prone behaviour pattern, called Type A, was first described by Friedman and Rosenman in 1959 (1). The behaviour is characterized by excessive drive, aggressiveness, ambition, involvement in competitive activities, frequent vocational deadlines, pressure for vocational productivity, enhanced sense of time urgency, restless motor mannerisms and staccato style of verbal response (2). It is succinctly defined as a competitive attempt to do and to achieve more and more in less and less time (3). Besides Type A behaviour, other factors which contribute to coronary heart diseases (CHD) are raised serum cholesterol, hypertension, cigarette smoking, obesity, diabetes, lack of exercise, and a family history of coronary disease (4). These risk factors could not account for all the cases of CHD. Psychosocial factors like social class, occupation, workload, personality traits and life events could also contribute to CHD.

AIM

The aim of this study is to find out the significance of Type A behaviour, personality traits and life events in the aetiology of coronary heart disease in local people.

MATERIAL AND METHODS

The study was carried out on 58 consecutive patients who were admitted to the cardiology department,

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Singapore General Hospital for acute coronary heart disease, and 58 normal healthy controls who were fathers of university students. The patients and subjects were required to complete the following questionnaires.

1. the Bortner Questionnaire to assess Type A behaviour (5)
2. the Eysenck Personality Inventory to assess the personality dimensions "extraversion" and "neuroticism" (6)
3. the Holmes and Rahe Social Readjustment Rating Scale to quantify life events (7)

In addition they were also asked to fill up a questionnaire on their social background and their alcohol and cigarette habits.

RESULTS

The Bortner Questionnaire (5) for assessing Type A behaviour consists of 14 items of behaviour. Each item of behaviour was measured on an analogue scale from 1 to 24 points. The maximum score for the 14 items would be 336 points. Men classified as showing Type A behaviour have a mean score of 211.5 points, while men classified as showing Type B behaviour have a mean score of 178.2 points. In this study, the subjects are divided into three groups: Type A for those scoring 211 points and above; Mixed for those scoring between 211 and 179, and Type B for those scoring 178 and below. Their detailed classification is shown in Table 1 below.

TABLE 1
CORONARY HEART DISEASE PATIENTS
AND TYPE A BEHAVIOUR

Subjects	Type A	Mixed	Type B
CHD patients	17	15	26
Healthy controls	5	17	36

$\chi^2 = 8.28$ Df = 2 $p < 0.02$

The personality dimensions "Extraversion", and "Neuroticism" as measured by the Eysenck Personality Inventory are shown in table 3. The scores for both the personality dimensions "extraversion" and "neuroticism" were within the normal limits of one standard deviation. The scores for "neuroticism" for the patients were slightly but significantly higher (more neurotic) than the controls.

The life events were measured by the Holmes and Rahe social adjustment scale which consists of 46 life events each having different loadings. The events that require more adjustments are given higher scores. The first 5 items on this scales are:

Life Events	Scores
1. death of spouse	100
2. divorce	73
3. marital separation	65
4. marriage	63
5. detention in jail	63

The subjects were told to indicate whether any of the events happened to them during the past 6 months and the past 12 months. The scores were totalled and compared in Table 3. The patients had about twice as much life event scores as the controls. Subjects having higher scores are known to be more likely to breakdown with an illness.

**TABLE 2
PERSONALITY DIMENSIONS**

Personality Dimension	Patient Mean Score	Control Mean Score	Significant Difference
Extraversion	10.0	9.5	NS
Neuroticism	11.0	7.2	$p < 0.001$

**TABLE 3
LIFE EVENTS PAST 6 MONTHS**

Life Change Units	Patient Mean Score	Control Mean Score	Significant Difference
Past 6 Months	36.3	28.2	$p < 0.001$
Past 12 Months	72.2	33.2	$p < 0.001$

Their alcohol habits as shown in Table 4 showed that slightly more patients than controls drank alcohol moderately. The difference is not significant. None of the patients or controls drank excessively.

As shown in Table 5, more patients than controls smoked cigarettes. Of the 31 patients who smoked, 16 had stopped smoking over the past one year, while out of the 14 controls, only one had stopped smoking. Patients who suffered from coronary heart disease were more motivated to stop smoking.

DISCUSSION

Psycho-social factors have been observed to play a role in the causation of coronary heart diseases. Early physicians like Heberden (1772), Osler (1892) and Dunbar (1943) suspected that there was a relationship between psycho-social stress and coronary heart

**TABLE 4
ALCOHOL HABITS**

Drinks Alcohol	Patients	Controls
No	27	33
Yes	31	25

$$X^2 = 1.24 \quad Df = 1 \quad p < 0.02$$

**TABLE 5
NUMBER OF CIGARETTE SMOKED PER DAY**

Cigarettes per day	Patients	Controls
Nil	31	43
1 - 10	3	9
11 - 20	17	3
21 - 30	7	2

$$X^2 = 17.83 \quad Df = 3 \quad p < 0.01$$

disease. The first systematic study on behaviour and coronary heart disease was by Friedman and Rosenman (1) who found that such patients exhibited a characteristic behaviour pattern which they term Type A behaviour. In the Western Collaborative Group Study, Rosenman RH et al (8) found that 178 (13.2%) out of 1589 Type A patients developed coronary heart disease over a period of 8½ years, but only 79 (5.9%) out of 1565 Type B people, developed CHD. They concluded that Type A behaviour is associated with an increased risk of CHD in employed, middle-aged US citizens. In our study in which patients suffering from coronary heart disease were assessed for Type A behaviour using the Bortner Scale, we found that there was an excess of Type A behaviour among CHD patients, confirming the role of such behavioural traits in aetiology of CHD.

The slightly higher score for neuroticism in CHD patients are expected as CHD is commonly associated with anxiety symptoms. Thiel (1973) (9) in a study of 50 CHD patients and 50 matched controls found the patients scored higher on anxiety and depression scales and reported more often feelings of nervousness and sleep disturbances. Neuroticism was also found to have significant correlations with physiological measurements of cardiovascular lability (10).

Life events have been shown to be associated with onset of many diseases. One of the most well used instrument for the measurement of life events is the Holme and Rahe scale (7). Lundberg et al (1975) (11) using this scale in a study of 56 CHD patients and 33 matched controls found that CHD patients had a higher total life change scores than the controls. This is consistent with our study which show that CHD patients had more life events prior to the onset of their illness than matched healthy controls. Kong (1985) (12) also found an excess of life events in 12 myocardial infarction patients compared with 12 healthy volunteers in Singapore. This confirms that life events can contribute to the development of coronary heart disease. The study also confirms the beneficial role of moderate drinking and the adverse effects of smoking in relationship to coronary heart disease.

Type A behaviour correlated positively with extraversion ($r = 0.34$). This is expected as both extraversion and Type A behaviour are outgoing traits. Type A behaviour also correlated positively with neuroticism ($r = 0.38$) which is a measure of autonomic instability.

CONCLUSION

It is important to consider psycho-social factors in the prevention of coronary heart disease. In this study, it was found that all the three psycho-social variables: Type A behaviour, neuroticism and life events are more preponderant in patients suffering from an acute coronary heart disease than healthy controls.

REFERENCES

1. Friedman M, Rosenman RH: Association of specific overt behaviour pattern with blood and cardiovascular findings. *J Am Med Assoc* 1959; 169:1289-92.
2. Jenkins CD, Rosenman RH, Meyer F: Development of an objective psychological test for the determination of the coronary-prone behaviour pattern in employed men. *J Chron Dis* 1967; 20:371-80.
3. Rosenman RH, Chesny MA: Psychological profiles and coronary heart disease. In: Kilholz P, Siegenthaler W, Taggart P et al. eds. *Psychosomatic cardiovascular disorders — when and how to treat*: Hans Huber Publishers 1980: 38.
4. Jenkins CD: Psychological and social precursors of coronary disease. *New Eng J Med* 1971; 284:244-55.
5. Bortner RW: A short rating scale as a potential measure of pattern A behaviour. *J Chron Dis* 1969; 22:87-91.
6. Eysenck HJ, Eysenck SBG: *Manual of the Eysenck Personality Inventory*. University of London Press Ltd., 1964.
7. Holmes TH, Rahe RH: The social readjustment rating scale. *J Psychosom Res* 1967; 11:213-8.
8. Rosenman RH, Brand RJ, Jenkins CD et al: Coronary heart disease in the Western Collaborative Group Study. Final follow-up experience of 8½ years. *J Am Med Assoc* 1975; 223:872-7.
9. Thiel HG, Parker D, Bruce TA: Stress factors and the risk of myocardial infarction. *J Psychosom Res* 1973; 17:43-57.
10. Burdick JA, Dyck BV, Von Bargen WJ: Cardiovascular variability and introversion/extroversion, neuroticism and psychoticism. *J Psychosom Res* 1973; 17:269-75.
11. Lundberg U, Theorell T, Lind E: Life changes and myocardial infarction: Individual differences in life change scaling. *J Psychosom Res* 1975; 19:27-32.
12. Kong SG: Psychosocial stressed preceding myocardial infarction. *Singapore Med J* 1985; 26:510-5.