# THE ROLE OF BEHAVIOR PATTERN AND EMOTIONAL RISK FACTORS IN CORONARY HEART DISEASE

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## ABSTRACT

For evaluating the role of behavior pattern and emotional factors in coronary heart disease (CHD), 86 patients were followed for one to three years (average 20 months). The behavior pattern itself was not considered as a main risk factor, rather it was found to be an aggravating and predisposing factor, especially in morbidity rate.

Both behavior patterns were more common in males than in females. 73% of male type A patients and 60% of male type B patients smoked, whereas smoking rate was equal among the female patients, amounting to 20% for both types. Thus smoking was considered as a major and prevalent risk factor in males especially those with type A behavior. 62% of patients included in the type A group had acute MI, while 56% of type B patients had the same condition. Thus, MI and its complications occured more commonly in type A than type B patients. However, the mortality rate, which was mainly due to anterior MI (90%), was the same in both groups.

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## INTRODUCTION

Among the surveys considering the well known risk factors of CHD, many are related to emotional risk factors and behavior patterns. It has been generally recognized that there is a close relationship between morbidity rate of CHD and daily increasing emotional risk factors,[2] but the surveys do not indicate the basic and fundamental relationship between behavior pattern, as a major risk factor, and CHD.[7]

Although the above mentioned factors are not essential in the etiology of CHD, they can increase the mortality rate when added to the well known risk factors such as hypercholesterolemia and hypertension.[3-5]

Inspite of the primary and secondary preventive methods, and considerable progress in treatment of angina pectoris and heart attacks during the last two decades, the CHD mortality rate has not yet decreased and has remained at the top of the list of the causes of death in the world.[7,8]

The result of this Iranian survey in which some of the patients were followed for one to three years (average 20 months) shows that the behavior pattern itself is not a major risk factor, rather it is an aggravating and predisposing factor, especially in morbidity rate.

## PATIENTS AND METHODS

All the patients who were admitted from January 1977 to February 1978 to the coronary care unit of the Cardiovascular Research and Treatment Center (Shahid Rajai Heart Hospital) were evaluated. The patients who where found not to have obvious CHD were omitted from the study. Only 86 patients with CHD were studied for behavior patterns A and B.

Type A behavior was characterized by:

1- An intense sustained drive to achieve self-selected but usually poorly-defined goals.

2- Profound inclination and eagerness to compete.

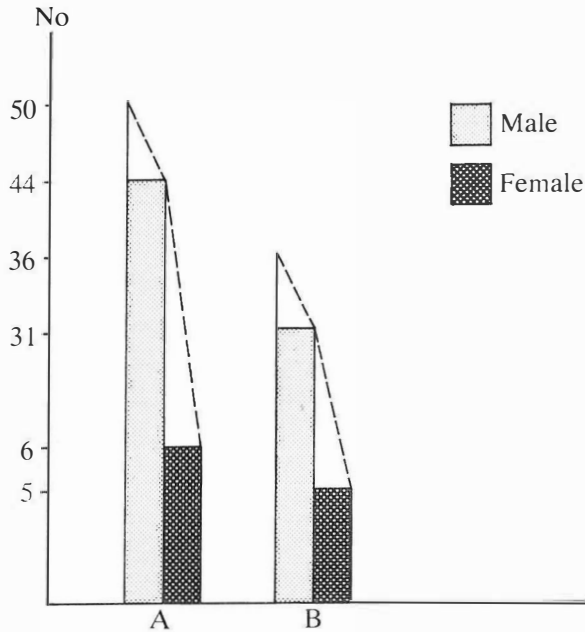3- Persistent desire for recognition and advancement.

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figure 1: Different behavioral Pattern in patients with CHD

4- Continuous involvement in multiple and diverse functions constantly subject to time restrictions.
5- Habitual propensity to accelerate the rate of execution of many physical and mental functions.
6- Extraordinary mental and physical alertness.

Type B behavior was formulated as the opposite of these.

Of course each of the two major types have been subdivided into complete or incomplete groups, but in this study we will generally group them to types A and B.

In addition to the behavior patterns, other risk factors such as hypertension, smoking, hyperlipidemia, diabetes mellitus, hyperuricemia and obesity were also studied.

## RESULTS

Among all the above mentioned patients, 50 persons (58.1%) were grouped as type A, 44 of whom were male (88%) and 6 were female (12%). The remaining 36 patients (41.9%) were categorized as type B, of whom 31 were male (86%) and 5 were female (14%) (Fig.1).

The mean duration of stay in the CCU was 7 days for type A and 6 days for type B patients, while the average duration of hospitalization was 18.5 and 23 days for type A and B patients, respectively.

The number of hospitalizations per year were the same for both groups and was one admission per year.

The average age of male group A patients was 52 years while that of male group B patients was 59 years.

Table 1. The number of hospitalization days and average of patients with CHD

|  | TYPE A | TYPE B |
|---|---|---|
| Average days in CCU | 7 days | 6 days |
| Average days in hospital | 18.5 days | 23 days |
| Average hospitalizations per year | 2 | 1 |
| Average age (male) | 52 years | 59 years |
| Average age (female) | 56 years | 62.2 years |

In females the average age was 56 years for type A and 62.5 years for type B (Table I).

Among males, 73% of type A and 60% of type B patients smoked. Smoking rate was equal among females, measuring 20% for both types. While 20% of type A and 29% of type B males suffered from hypertention, the prevalence of hypertension among females was 66% and 60% for type A and B, respectively.

The prevalence of diabetes mellitus was the same for both types (18%), and that of hypercholesterolemia was 30% for type A and 23% for type B patients. Obesity was found in 22% of type A and 25% of type B patients (Table II).

Table 2. Frequency of risk factors in patients with CHD (Type A and B).

| RISK Factor | TYPE A | TYPE B |
|---|---|---|
| Smoking rate (males) | 73% | 60% |
| Smoking rate (females) | 20% | 20% |
| Hypertension (males) | 20% | 29% |
| Hypertension (females) | 66% | 60% |
| Diabetes mellitus | 18% | 19% |
| Hypercholesterolemia | 30% | 23% |
| Obesity | 22% | 25% |

62% of type A patients had acute myocardial infarction, while 56% of those belonging to type B had the

Table 3. Location of myocardial infaretion in patients with CHD (type A and B).

|  | TYPE A | TYPE B |
|---|---|---|
| Acute MI | 62% | 56% |
| Ant. Wall | 42% | 30% |
| Inf. Wall | 14% | 18% |
| Lat. Wall | 6% | 8% |

124

same condition. Of this, 42% was anterior, 14% due to posterior, and 6% due to lateral infarction and this categorization for type B patients was as follows: 30% anterior, 18% posterior, and 8% lateral (Table III).

**Table 4. Complications in type A or type B behavioral pattern in patients with CHD.**

|  | TYPE A | TYPE B |
|---|---|---|
| ACUTE MI | 62% | 56% |
| OLD MI AND ISCHEMIA | 38% | 44% |
| COMPLICATIONS | 52% | 38% |
| MORTALITY | 20% | 22% |

The remaining patients (38% of type A and 44% of type B patients) suffered from old infarction and/or ischemia. The rate of complications of these diseases was 52% for type A and 38% for type B, but the mortality rate was the same (20%) for the two types (Table IV)

The average level of CPK in patients with myocardial infarction was 331 units in type A, and 654 units in type B patients. The average SGOT level was 80 units in type A and 96 units in type B, and LDH was 325 units in type A and 404 units in type B patients (Table V).

**Table 5. Average level of different enzymen in type A or type B behavioral pattern in patients with CHD.**

|  | ENZYME | |
|---|---|---|
|  | TYPE A | TYPE B |
| CPK | 331 IU | 654 |
| SGOT | 80 IU | 96 |
| LDH | 325 IU | 404 |

## DISCUSSION

This study, similar to other studies, shows the prevalence of CHD to be more common in males than females.[7,8] Although the mean duration of admission to the CCU is longer in type A than type B, the average duration of hospitalization is longer in type B than type A patients.

The mean age of patients is lower in males than females and also in type A than type B patients.

Smoking is considered to be a major and prevalent risk factor in males, especially in those belonging to group A. Hypertension is also a very important risk factor with a high prevalence in women, especially type

A. Among the risk factors, hypercholesterolemia is more significant in type A. Although Friedman and Rosenman in one survey have shown that hypercholesterolemia is much more common in type A than type B patients, and that these patients have higher standards of height, weight, and calorie intake, as well as higher incidence of CHD (7 times more than type B) and arcus senilis (3 times more than type B), the majority of surveys and studies do not emphasize these rates and ratios.[4]

The prevalence of diabetes in our study is approximately equal in both types. Although the prevalence of myocardial infarction and its complications is higher in type A than type B patients, mortality rate, 90% of which was due to anterior myocardial infarction, was the same in both types.

In one study, Friedman showed that of 25 deaths occurring in type A patients, 22 were due to CHD. Postmortem studies showed that regardless of the cause of death, atherosclerosis of coronary arteries was 6 times more frequent in type A than type B patients.[6-8]

They believe that this is due to the higher rate of hypercholesterolemia and hypersecretion of catecholamines in type A patients.

The role of emotional stress in CHD can be seen in accordance with Carruthers' hypothesis.[3-6] In this connection, Funkenstein believes that the level of norepinephrine increases in active emotional conditions, while that of epinephrine is related to passive depressive conditions. In other words norepinephrine release is associated with aggressive emotions, whereas epinephrine release is associated with anxiety. Therefore we can conclude that:

1- Although it has been assumed for a long time that emotional stress factors have a role in the etiology of CHD, there is no scientific convincing reason documenting this suggestion.

2- The relationship between emotional stress and CHD is due to sympathetic hyperactivity response to different stress situations and personality types, and also results from hypersecretion of epinephrine and norepinephrine.[3]

3- In the presence of CHD and emotional stress, especially in type A behavior pattern, we can prescribe beta blockers and decrease tachycardia, cardiac arrhythmias, and unpleasant signs of emotional conditions.[6]

## REFERENCES:

1- Type A Behavior Pattern Meyer Friedman, M.D. Bull.N.Y. A cad.Medi Vol.53, No.7 sept 1977 P: 593-605
2- Work Activity and Coronary Heart Mortality Ralphs. Paffenbarger, JR. MD, and Wayne E. Hale. A.BN.J.M Volume 292 March

13-1975, No,11, P: 545-550.

3- Mario Bergamaschi, Ph.D. Anne M.Longoni, D.Sc. Milano, Italy A.H.J Vol 86 No 3 Sept 1973, P: 385-394

4- Social and psychological Risk Factor in coronary Heart Disease S.Leonard Syme Ph.D. Modern concept of Cardiovas Di. vol XIIV No 4 April 1975.

5- Analysis of Epidemiologic studies of physical inactivity as Risk Factor for Coronary Artery Disease Victor F.froelicher and Albert Oberman Progress in CVD Vol XV No 1 July-Aug 1972.

6- Stress and Heart, Second Edition David wheatly 1981 Part 1 Behavior Patterns and Emotional Stress in the Etiology of CAD: Cardiological and Biochemical correlates P.Taggart and M.Carruthers P: 28-30.

7- Text Book of Cardiovas cular Medicine, Braunlood 1984, Part III, Chapter 38, P: 1301-2, Part III, Chapter 35, P: 1206-7

8- The Heart J.Willis Hurst 1982., Part V, Chapter 43, P: 839, part V, Chapter 45, P: 966, Part VI, Chapter 81, P: 1524-25