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PSYCHOLOGICAL ASPECTS IN REHABILITATION OF CORONARY HEART DISEASE

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ABSTRACT. Acute myocardial infarction has been increasing in Japan and the male to female ratio since 1964 is 2.7 : 1. The one-year survival rate of 164 cases was 92.7%. The rate of return to work of the patients below age 65 was 85% and two-thirds of them returned to work within 6 months. In 28 cases among 139 infarction patients, anxiety states provoked by iatrogenic factors and other psychological factors related to environment or symptoms retarded the recovery to ordinary life. The director type (Guilford-Yatabe) was the major type in the coronary groups in both sexes and the incidence of behavior pattern A (Friedman et al.) was higher in the female coronary group than the control housewife group. The serum levels of cholesterol and triglycerides of the male coronary group below age 60 were higher in behavior pattern A.

The prevalence of coronary heart disease in Japan has certainly been increasing and the cardiologists are becoming increasingly concerned with the rehabilitation programme of this disease.

This study was designed first to analyse the problems in rehabilitation mainly from the psychological aspects and secondly to clarify the features of personality or behavior pattern of the patients with coronary heart disease.

Prevalence of myocardial infarction and survival rate

During the past 18 years of study, I have encountered 246 cases of acute myocardial infarction among Japanese living mainly in the Tokyo metropolitan area. The prevalence of acute myocardial infarction was determined for each decade of life for each sex in two groups; A (1952–63) and B (1964–69). The male to female ratio in group A was 5.7 to 1, while it changed to 2.7 to 1 in group B, as shown in Fig. 1. The average ages at the onset of the disease for male and female were 61.2 and 63.0 years respectively.

The survival rate of the patients who lived beyond 1 month after the initial attack of acute infarction is shown in Fig. 2. The one-year survival rate was 93% and that at 5 years was 66%. In the patients below age 60, the one-year and five-year survival rates were 99 and 88% respectively, while those of over age 60 were 88 and 51% (Fig. 2).

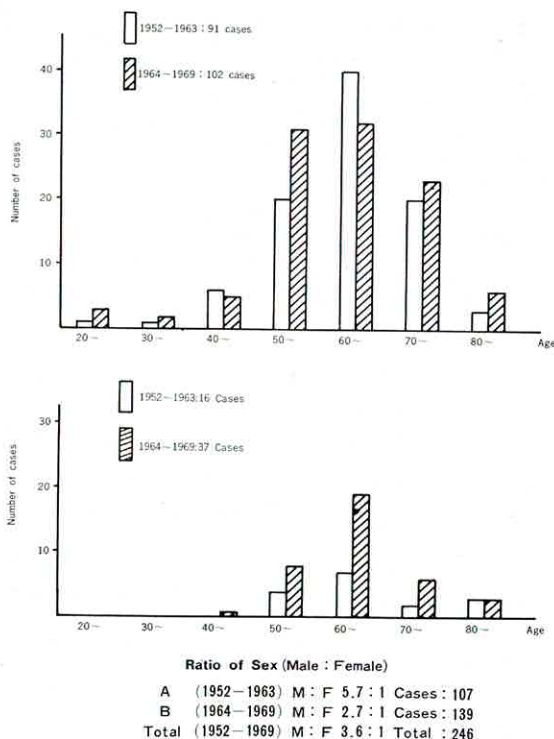
Return to work after the initial infarction

One-hundred-and-nineteen of the male cases with acute infarction who survived beyond 1 month have been followed up. During the 2 year follow-up, 98% of the patients below age 60, 85% of the patients of age 60 to 64, and 67% of the patients over age 65 returned to work with more than half their previous work load as shown in Table I. Seventy-three per cent of the patients below age 65 returned to work within 6 months as shown in Table II. Nineteen cases did not return to work, 12 of which because of physical disability and 7 due to voluntary retirement. We did not find disability retirement due to psychological reasons only.

Anxiety state and rehabilitation

The prolongation of the time from initial infarction to resumption of work was attributable to psychological disorders as well as the recovering functional capacity of the ailing heart. Among 139 cases with acute myocardial infarction which were followed up, there were 28 cases as shown in Table III, in which retardation in rehabilitation was thought attributable to anxiety states. The most important causes of patient invalidity due to anxiety were emotional embarrassment provoked by doctor's overwarning of unpredict-

[1] Paper read at the Council in Rehabilitation of the International Society of Cardiology

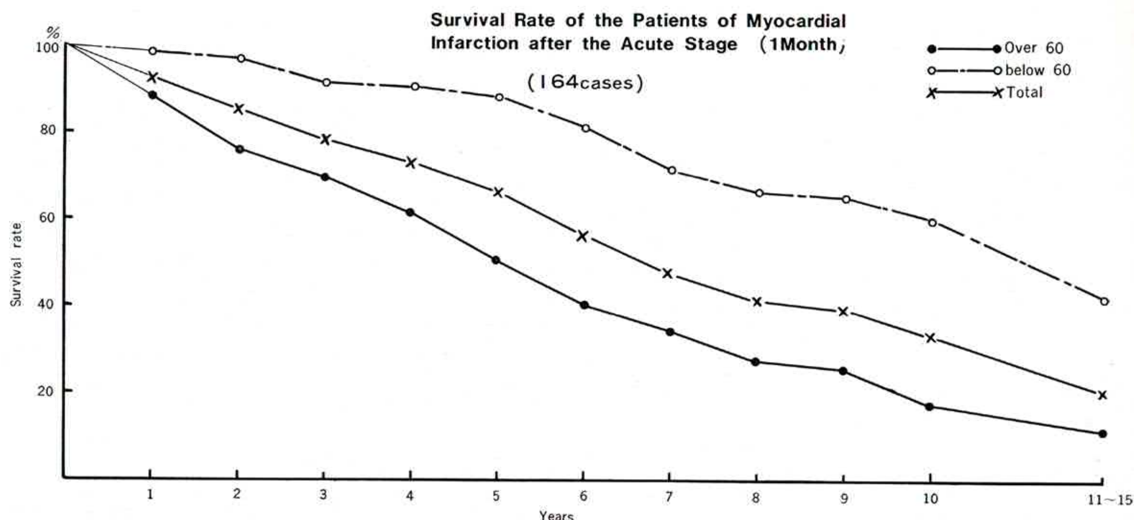


able sudden death or recurrence, over-restriction of exercise and trips, or the way of living in general, and excessive medication of the patients.

In such cases where the attacks of infarction were elicited by emotional stress such as sudden death of relatives or intimate friends, or where the in-patient encountered a disastrous scene of another dying patient in the same ward or CCU, the convalescence of the patients, particularly those of emotionally unstable or neurotic tendency, was often prolonged and return to ordinary life was postponed. There were some cases in which prolonged anxiety states were attributable to the reminiscence of their most disastrous critical condition at the initial attack.

An episode of angina or the shoulder–hand

Fig. 1. Age and sex distribution of myocardial infarction among Japanese in the past 18 years (1952–69).
Ratio of sex (male female):
A (1952–63) MF 5.7 : 1 Cases: 107
Total (1952–69) MF 3.6 : 1 Total: 246.



Age	Cases	Survival rate in %										
		1y	2y	3y	4y	5y	6y	7y	8y	9y	10y	11~15y
Over 60	93	88.2	76.7	69.5	61.6	50.8	40.7	34.7	27.3	25.6	17.9	12.8
Below 60	71	98.6	97.0	91.7	90.6	88.4	81.8	71.4	66.7	65.2	61.9	42.9
Total	164	92.7	85.3	78.9	73.8	66.3	56.3	48.1	41.2	39.4	33.3	20.8

(1969)

Fig. 2. Survival rate of the patients with myocardial infarction after the acute stage (1 month).

syndrome often arouse the sufferers' suspicion of recurrence and fear of repeatedly appearing pain which brought the patients to anxiety states. These made them as invalid as though they really had disabling angina or impending infarction. Persistence of arrhythmia often made the patient heartconscious.

Personality profiles of the patients

To classify the personality traits of the patients with coronary heart disease, the modified Guilford Personality Inventory, called Guilford-Yatabe test (1) composed of twelve items was adopted. The types of personality profile were classified as (A) Average type, (B) Black list type, (C) Calm type, (D) Director type, and (E) Eccentric type, as shown in Table IV. One-hundred-and-thirty-nine male cases and 30 female cases of coronary heart disease (either myocardial infarction or angina pectoris) were assessed according to this personality inventory.

Table I. *Percentage of return to work (males: 119 cases)*

	Age (years)			
	Below 60 *n*	60–64 *n*	Over 65 *n*	Total *n*
No. of cases	46	34	39	119
Return to work	45	29	26	100
Disability retirement	0	4	8	12
Voluntary retirement	1	1	5	7
Percentage of return to work	97.8%	85.3%	66.7%	83.2%

Table II. *Interval from initial infarction to resumption of work (119 males)*

	Below 65		Over 65		Total	
	n	%	*n*	%	*n*	%
Return to work, months						
Under 3	15	20.3	4	15.4	19	19
3–5	39	52.7	11	42.3	50	50
6–11	16	21.6	9	34.6	25	25
Over 12	4	5.4	2	7.7	6	6
Total	74	100	26	100	100	
Retirement						
Disability	4		8		12	
Voluntary	2		5		7	
Total	80		39		119	
Percentage of return to work	74/80 : 90.3%		26/39 : 66.7%		100/119 : 83.2%	

Table III. *Anxiety states which retarded rehabilitation of the patients surviving acute myocardial infarction (158 cases)*

1. Iatrogenic anxiety states: (over-restrictions, warning of sudden death or recurrence)	6 cases
2. Deaths of relatives, intimate friends, or patients in the same room:	7 cases
3. Retrospection of the critical attacks:	3 cases
4. Post-infarction angina or shoulder–hand syndromes:	8 cases
5. Persisting arrhythmia:	4 cases

Table IV. *Types of Gilford-Yatabe personality assessment*

		Factors		
Groups	Pattern	Emotional stability	Social adaptability	Version
A: Average type	Average	Average	Average	Average
B: Black list type	Right-sided	Unstable	Inadaptability	Extraversion
C: Calm type	Left-sided	Stable	Adaptability	Intraversion
D: Director type	Descending rightward	Stable	Adapt. or average	Extraversion
E: Eccentric type	Descending leftward	Unstable	Inadapt. or average	Intraversion

In both male and female groups, the type (D) who is assessed as emotionally stable and extrovert, both registered 47%, which exceeded all other types, as shown in Fig. 3. This was compared with the control groups in both sexes of apparently healthy people in fifth to eighth decades. The majority of the male control group were executives and the female control group included mainly housewives.

Fig. 4 shows higher incidence of depressive temperament, unstable cyclic tendency, lack of objectivity, nervousness, social extroversion and general drive for activity in the coronary female group in comparison with the control housewife group.

The profiles of the average scores of the twelve traits in the female coronary and the control

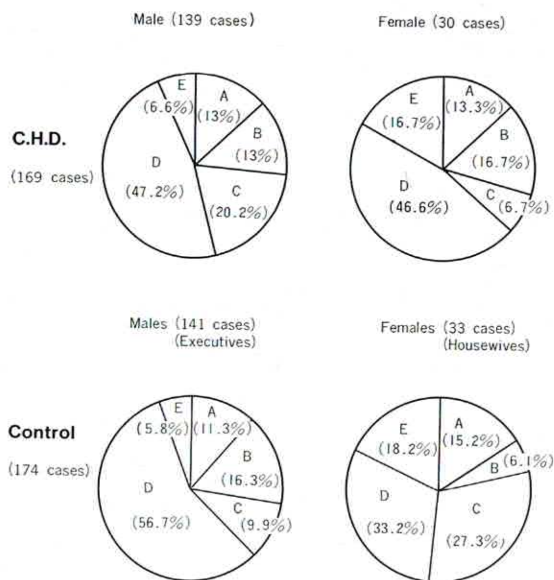


Fig. 3. Guilford-Yatabe Personality Inventory. (Distribution of the groups: A, B, C, D, E).

housewife groups reveal the tendencies to emotional unstableness, aggressive, active and extrovert personality in the female coronary group as shown in Fig. 5.

Assessment of the overt behavior pattern of the patients

By personal interview of 111 cases with infarction or angina pectoris we selected subjects exhibiting A and B behavior patterns (2) as shown in Fig. 6. Incidences of behavior pattern A among the male were 33.3% in the coronary group and 37.2% in the executive group. However, there was the higher incidence of pattern A in the female coronary group (33.3%) in comparison with the control housewife group (20%) and the percentage of pattern A was of the same in the coronary groups for both sexes.

As to the presence of long-standing tension preceding the attack of coronary heart disease, there was higher rate in the coronary groups than in the control subjects, as shown in Table V. It was particularly high in the female coronary group, 61% compared with 20% in the control housewife group. The incidence of overt behavior pattern A with long-standing tension had a significantly higher rate in female coronary group compared with the control housewife group, being 28 and 4% respectively.

We analysed the levels of serum cholesterol and triglycerides of two converse behavior patterns among the male coronary groups below age 60 as shown in Table VI. The levels of serum cholesterol of behavior pattern A and B were 226 mg and 191 mg/dl respectively, and those of triglycerides were 200 mg and 122 mg/dl respectively, which difference is significant ($P > 0.02$).

DISCUSSION

Prevalence of acute coronary infarction has been increasing in Japan in both sexes and the ratio between sexes has been changing remarkably. The male to female ratio for the last 6 years is 2.7 : 1, while it was 5.7 : 1 during 12 years prior to 1964. The one-year survival rate of the patients with initial acute infarction who lived beyond 1 month is 92.7% and that of the patients below age 60 was as high as 98.6%.

The rate of return to work of patients below age 60 was 98% and below age 65 was 85%. Two-thirds of them returned to work within 6 months of the initial episode of myocardial infarction.

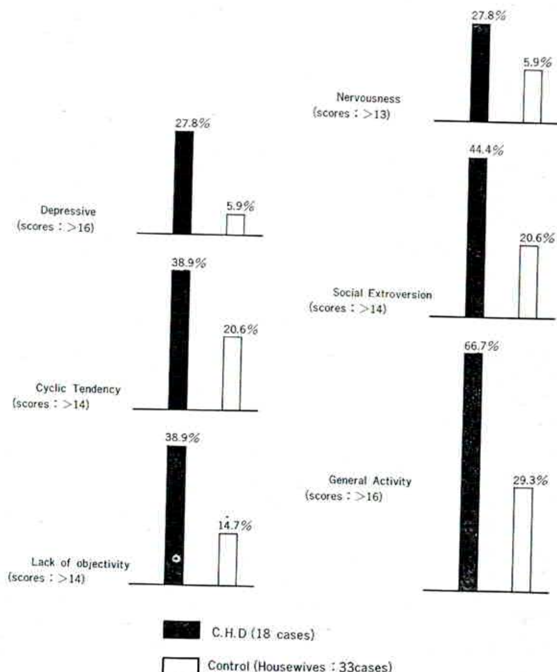


Fig. 4. Guilford-Yatabe personality assessment (female).

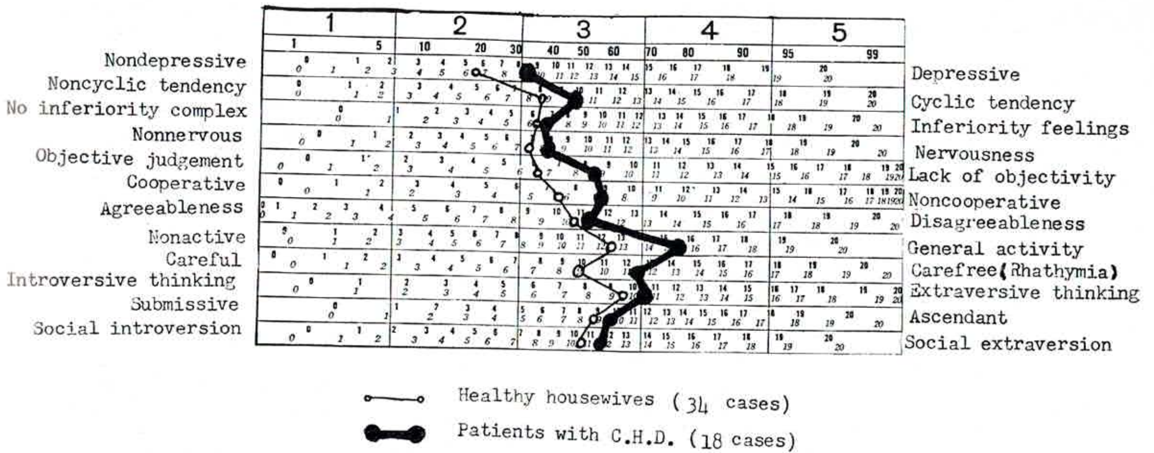


Fig. 5. Guilford-Yatabe personality assessment (female).

Although disability retirement due to psychological reasons only was nil, the time from the initial infarction to resumption of work was certainly influenced by psychological factors during rehabilitation.

Anxiety states of the patient provoked by iatrogenic factors must be avoided through appropriate guidance by the medical team. Early mobilization programmed by assessment of exercise testing is recommended in producing optimism for future recovery from the disease, while needless or over-restriction imposed on the coronary patients often provokes persisting anxiety states.

Angina pectoris or any other chest pain that might be mistakenly referred to the heart and bothering arrhythmia should be medically controlled without delay. The catastrophic scene of the dying patient should be screened from other patients and further psychological considerations at CCU are advised.

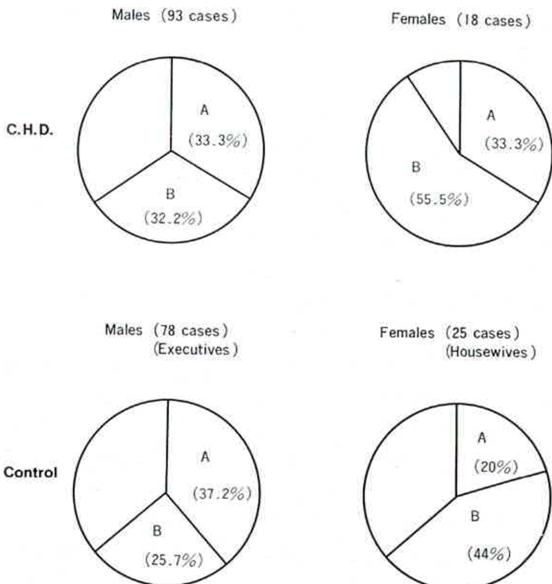


Fig. 6. Overt behavior pattern A and B.

Table V. *Long-standing tension (worries or anxieties)*

Group	Male	Female	Total
Long-standing tension (worries or anxieties)			
C.H.D.	31/93 (33.3%)	11/18 (61.1%)	42/111 (38.8%)
Control	18/78[a] (23.1%)	5/25[b] (20.0%)	23/103 (22.3%)
Behavior pattern A with tension			
C.H.D.	18/93 (19.4%)	5/18 (27.8%)	23/111 (20.7%)
Control	13/78[a] (16.7%)	1/25[b] (4%)	14/103 (13.5%)

[a] Male: mainly executives.
[b] Female: mainly housewives.

Table VI. *Patient with C.H.D. under 60 years (male)*

Behavior pattern	Cholesterol	Triglyceride
Type A	225.7 ± 14.7 (*N*: 14)	199.8 ± 20.8 (*N*: 10)
Type B	191.3 ± 9.9 (*N*: 7)	122.1 ± 13.4 (*N*: 7)
Pat. Type A vs. Type B	N.S.	<0.02

Improper explanation of the disease to the patient, particularly with needless emphasis on irreversible pathological changes should be avoided and successful cases of early mobilisation such as playing golf and travelling should be talked about as an encouraging topic. Initiation of anticoagulation treatment might give the patient psychological assurance of the prevention of recurrence and helps to set up a good patient–doctor relationship.

We analysed the personality profiles of the patients by the Guilford-Yatabe Personality Inventory. Director type (D) was the major type in the coronary groups for both sexes and the control male executives. The incidence of D group was somewhat higher in the control executive group than the male coronary group. This is compatible with the fact that the prevalence of coronnary heart disease in Japan is definitely higher in the executive group than in the non-executive group. However, the incidence of D group was definitely higher in the female coronary group than in the apparently healthy housewife group. The distribution of personality assessment in the female coronary group was very much like the male coronary or executive groups, except for the higher percentage of Eccentric type in women who are emotionally unstable.

The personality of the female coronary patients revealed more active, extrovert and emotionally unstable trends, compared with the control housewife group.

We also analysed the behavior patterns of the patients and the controls. It has been reported by Friedman & Rosenman and others (2), that a particular overt behavior pattern as called pattern A is implicated in the pathogenesis of clinical coronary heart disease occurring in young and middle-aged subjects. This behavior pattern is characterized notably by enhanced drive, competitiveness, ambitiousness, an excessive sense of urgency of time which appears to stem particularly from habitual immersion in multiple vocational and avocational pursuits subject to "deadlines" time pressure. Conversely, subjects without such behavioral characteristics, as called pattern B were reported to possess a relative immunity to the occurrence of clinical coronary heart disease. They also reported that men of pattern A exhibited higher lipid levels than those of pattern B.

The incidence of behavior pattern A was higher in the female coronary group compared with the control housewives group. The serum levels of cholesterol and triglycerides of the Japanese male coronary cases below age 60 were higher in behavior pattern A in comparison to B, but no significant difference in the level of serum lipids was noted in the control male executive group below age 60.

SUMMARY

Prevalence of acute myocardial infarction has been increasing in both sexes in Japan and male to female ratio since 1964 is 2.7 : 1. The one-year survival rate of 164 cases was 92.7%. The rate of return to work of the patients below age 65 was 85% and two-thirds of them returned to work within 6 months.

In 28 cases among 119 infarction patients, anxiety states provoked by iatrogenic factors and other psychological factors related to environment or symptoms retarded the return to ordinary life. Improper explanation of the pathology of coronary heart disease, needless or overrestriction imposed on the coronary patients should be avoided and early mobilisation programmed by assessment of exercise testing is recommended in producing optimism for the future recovery.

As to the personality profiles, the Director type as assessed by the Guilford-Yatabe test was the major type in the coronary groups in both sexes. The coronary female group was more active, extrovert and emotionally unstable than the control housewife group.

There was no definite difference in the incidence of behavior pattern A (Friedman) among the male coronary and male executive groups, however, incidence of behavior pattern A was higher in the female coronary group than the control housewife group.

The serum levels of cholesterol and triglycerides of the male coronary group below age 60 were higher in behavior pattern A, but there was no significant difference in the level of serum lipids between pattern A and B in the control executive group below age 60.

Mental stress, personality characteristics and behavior patterns are thought to be important factors in eliciting coronary heart disease and also in the fate of its recovery.

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