MMPI: COMPARISON BETWEEN PATIENTS WITH CORONARY HEART DISEASE AND THEIR SPOUSES TOGETHER WITH OTHER DEMOGRAPHIC DATA

A Preliminary Report

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ABSTRACT. A group of male patients with proven myocardial infarction chosen from individuals seen by a Cardiac Work Evaluation Unit were studied from social, medical, psychological and vocational points of view. MMPI's were administered to both patients and their spouses. Without the benefit of information later obtained from this screening test, comprehensive advice was given to patients whose progress was then followed. A study of the MMPI data showed the presence of marked depression as well as other emotional disturbances in patients when compared with their spouses. The study indicates the value of testing both spouse and patient in order to include her in a counselling program which may bring about more successful rehabilitation. The value of a multidisciplinary approach such as can be provided by a work evaluation unit team to facilitate and follow this process is also apparent.

This preliminary report is the product of the Cardiac Work Evaluation Unit of the South Nassau Communities Hospital situated in Long Island, New York. The Unit which consists of a medical director, an assistant physician, a social worker, a clinical psychologist and a vocational psychologist accepts only those individuals with established heart disease who have a vocational problem. Material was collected by the team members so that focus was brought to bear on social, medical, psychological and vocational aspects of each patient. The information was obtained by means of interviews, physical examination and laboratory studies. In addition, Minnesota Multiphasic Personality Inventories were administered to both patient and spouse. After the team met to exchange information, a comprehensive rehabilitative program was offered to each patient in the presence of the spouse. Advice was directed towards medical, vocational and psychological problems. MMPI scores had in the past not been available at that time and so did not figure in either the diagnostic work-up or in the advice given.

The following findings represent one small aspect of a much larger study now in progress involving some 600 patients seen by the Unit during the past 10 years. For the purposes of the report 142 males were selected, all of whom presented unequivocal evidence of a previous myocardial infarct as judged by generally accepted criteria. Lack of follow-up information reduced the number of individuals fully studied to 128.

METHODS

The statistical analysis contains 93 variables consisting of 18 pieces of demographic data for each patient (Table I), 25 MMPI scales for the patient, the same scales for the spouse and finally the differences of these scales between patient and spouse. The MMPI scales were standardized in the usual manner and expressed as T scores. All 93 variables were appropriately coded and punched on IBM cards. A 93 by 93 correlation matrix was generated utilizing an IBM 360 Computer. Only 5 columns of the matrix were analyzed in this study. They are the Functional Capacity and Therapeutic Classifications which have been combined into one, and 3 follow-up variables; namely the medical and psychological state and the vocational adjustment. Correlations significant at the 0.05 level or better were accepted. In addition, mean and standard deviations were inspected on MMPI data to look for any possible departure from normal.

Table I. *Demographic data (patients)*

1. Age
2. Education
3. Socio-economic status
4. Social adjustment at time of initial interview
5. Psychological adjustment at time of initial interview
6. Pre-illness vocational adjustment
7. Vocational adjustment at time of initial interview
8. Presence of other significant disease
9. Physical capacity for work at time of initial interview
10. Psychological capability for work at time of initial interview
11. Time interval between illness and Unit assessment
12. Functional Capacity and Therapeutic Classification
13. Motivation for work at time of initial interview
14. Length of follow-up
15. Medical status on follow-up
16. Psychological state on follow-up
17. Vocational adjustment on follow-up
18. Acceptance of Unit recommendations

Table II lists the 25 MMPI scales which were analyzed. The first 4 are validity scales, the next 10 clinical and the last 11 are special ones forming part of the Mayo Clinic Automated MMPI Program (11). A very significant difference between mean scores would be of the magnitude of one standard deviation. While the study is exploratory and the possibility of chance cannot be entirely eliminated, certain findings warrant attention.

RESULTS

Analysis of the demographic data much of which is in the nature of global judgments by the Unit yielded the following information:

The mean age was 49.4 years with 80 % of the patients between 40 and 59 years of age. The mean education level for the entire group indicated 12 years of schooling. Socio-economic status based on earnings, home conditions etc. was divided into lower, middle and upper levels. The mean value was 1.23 indicating that the group as a whole was slightly above the middle level. Social adjustment at the time of the initial interview was judged to be satisfactory in more than 77 % of the patients while only 36 % were found to be in a satisfactory psychological state. Almost 61 % demonstrated adequate pre-illness vocational adjustment. However, at the time of their visit to the Unit 37 % were unemployed, 36 % had made an inadequate vocational adjustment to their illness and only 27 % were working in a satisfactory manner. Thirty-two percent had one or more significant diseases other than myocardial infarction, the most frequent being hypertension, peptic ulcer

and diabetes. Ninety-nine percent of the patients were regarded as being physically capable of working while 84 % were judged to be psychologically capable of gainful employment. The time interval between myocardial infarction and Unit assessment was more than 6 months in approximately two-thirds of the patients and less than 6 months in the remaining third.

Using the New York Heart Association Classification (4) two physicians determined the Functional Capacity which ranged between Class I and III with 87 % in Class II while the Therapeutic Classification fell into Classes A, B and C with 80 % in Class B; indicating that the large majority were regarded as IIB patients. Eighty-six percent of the patients appeared to be motivated for work.

Follow-up interviews by team members were done in the majority of cases but in some, information was obtained by letter or by telephone. The average length of follow-up in 128 cases was 19 months. In 10 % of the patients such information was not available. In 69 % there was no change in the medical status. Eight percent were better and 13 % were worse. From a psychological standpoint 36 % were unchanged, 47 %

Table II. *MMPI scales used in testing patients and spouses*

Validity scales
  Cannot say
  L
  F
  K

Basic clinical scales
  Hypochondriasis (Hs)
  Depression (D)
  Hysteria (Hy)
  Psychopathic deviate (Pd)
  Masculinity—femininity (Mf)
  Paranoia (Pa)
  Schizophrenia (Sc)
  Hypomania (Ma)
  Social introversion (Si)

Special scales
  A (First Factor)
  R (Second Factor)
  Es (Ego strength)
  Lb (Low back pain, functional)
  Ca (Caudality)
  Dy (Dependency)
  Do (Dominance)
  Re (Social responsibility)
  Pr (prejudice)
  St (status)
  Cu (control)

were improved and 16% were worse. The Unit's recommendations had been fully accepted by 40% of the patients, partially accepted by 32% and not accepted by 18%. There were 10 deaths in the entire group during the period of follow-up.

In examining the patients' MMPI profile (Table III) the findings on the Depression scale (D) were highly significant and indicate that their mean score would be attained by less than 2.5% of the general population. Fifty-one percent of the patients had a score of 70 or above while only 15% scored below 60. Eighty-three percent had scores at least one standard deviation above the mean for normal subjects.

Significantly elevated mean scores were also found on the Hypochondriasis scale (Hs), the hysteria scale (Hy), the Psychasthenia scale (Pt) and on the Low Back Pain scale (Lb). In fact the mean scores in 9 of the 10 clinical scales were remarkably higher than the means established for normal subjects. The validating scores (L,F) related to social desirability and the need to appear sick do not suggest that these scores were false or misleading. Of 11 trait scales which have been more recently developed, 5 were abnormally high.

From these findings there emerges a composite picture of the patient who has had a myocardial infarct. He is profoundly depressed, shows a narrowing of interests, is both passive and dependent and tends to give up easily. He is dissatisfied with his status, lacks hope for the future and therefore his morale is poor. In addition, there are feelings of uselessness and deep concern about the reality of his life. He is pre-occupied with his physical well-being extending beyond his heart to involve his entire body. The marked intercorrelation of the scales labelled Hypochondriasis (Hs), Hysteria (Hy), Psychasthenia (Pt) and Low Back Syndrome (Lb) suggest that somatic concern is a shared ingredient. As indicated by the elevated score on the neurotic triad (Hs,D,Hy), patients tend to use somatisation as their primary defense against anxiety. They are in fact significantly "neurotic".

It would appear that the healthier defenses are not being mobilized sufficiently to satisfactorily reduce anxiety and tension precipitated by the illness. They cannot utilize repressive defense mechanisms adequately and as a result become apathetic, inefficient and regressive in their be-

Table III. *Mean and standard deviations of significant MMPI data expressed as T scores*

MMPI scales	Mean	Standard deviation
Patients		
Hypochondriasis	63.69	13.9
Depression	70.13	12.2
Hysteria	63.14	10.8
Psychasthenia	59.20	11.7
Low Back Pain	60.31	11.4
Spouses		
Depression	58.06	9.3
Low Back Pain	58.98	10.7
Patients minus spouses		
F	3.78	10.1
Hypochondriasis	10.06	16.9
Depression	12.07	15.2
Hysteria	5.76	15.1
Psychopathic deviate	4.50	13.2
Masculinity	9.57	13.8
Psychasthenia	6.25	13.6
Schizophrenia	3.19	14.1
Hypomania	6.63	12.9
Social introversion	−3.07	11.1
Anxiety	3.88	12.1
Ego strength	−3.98	12.5
Caudality	6.78	12.4
Dependency	4.37	11.4
Social status	2.38	9.2
Control	6.73	14.9

havior. There is a pervasive fear of being overwhelmed.

As a group, and in contrast to the patients, their spouses had mean scores in all the scales which were generally within normal limits (Table III). Only 13% of the spouses scored 70 or more on the Depression scale (D). Their highest scores were found on the Depression (D) and Low Back Pain (Lb) scales suggesting that they too were somewhat depressed while experiencing considerable tension and anxiety; reacting with the feeling that they were heavily burdened. They appeared to respond to their dilemma with lack of confidence.

Where differences were found between patients and spouses, the latter exhibited greater adequacy (Table III). Patients tended to present themselves more negatively and to be more dissatisfied with their personal and family lives. They had a greater inclination to project responsibility onto others and to feel that those around them lacked understanding of their problems. They did not find satisfaction in doing the things that moti-

Table IV. *Correlates of functional capacity and therapeutic classification*

Variables	Significant correlations
MMPI scales	
Patients	
Cannot say	
L	0.25
F	0.30
Hypochondriasis	0.25
Hysteria	0.33
Ego strength	0.25
Dominance	−0.34
Control	−0.22
	−0.30
Spouses	
Dominance	−0.21
Social status	−0.24
Patients minus spouses	
Cannot say	
L	0.20
F	0.25
Hypochondriasis	0.20
Hysteria	0.29
Ego strength	0.21
	−0.31
Demographic data (patients)	
Schooling	
Vocational adjustment at time	−0.20
of initial interview	
Physical capacity for work	−0.29
Presence of other disease	−0.19
Length of follow-up	0.39
	−0.20

R 0.18 = p 0.05. R 0.24 = p 0.01.
− indicates negative correlation.

vate most people and therefore did not explore their environment. They seemed to show greater than usual interest in feminine types of activities.

On the other hand, the spouses are inclined to possess greater ego strength, stronger feelings of personal adequacy and a better sense of reality. They are less socially introverted, are readier to take initiative and are better able to influence the behavior of others. Thus they are considerably healthier than the patients from a psychological point of view and function for the most part within the normal range.

The significant correlations between the combined Functional Capacity and Therapeutic Classification and the personality variables as judged by MMPI scores (Table IV) indicated that the sicker the patient:

1. The more cautious and defensive he is and the greater is his need to show himself in a good light.

2. The greater his preoccupation with body function and concern about physical health.
3. The poorer his ego strength.
4. The less is his potential for adjustment.
5. The weaker is his sense of reality.
6. The greater are his feelings of inadequacy.
7. The less dominant and the more rigid is his psychological control.
8. The more dissatisfied is he with his family and social life.

When compared with the spouse the sicker the patient:

1. The less dominant is the spouse.
2. The lower is her sense of status, security and self-confidence.
3. The higher is her level of anxiety.
4. The less adequate is her social poise.

These findings suggest that differences between patient and spouse lessen with increasing physical disability, indicating that when patients suffer from more advanced disease, the spouses are less secure and more anxious.

Table V. *Variables significantly correlated with medical and psychological state as well as vocational adjustment on follow-up*

Variables	Medical	Psychological	Vocational
MMPI scales			
Patients			
Cannot say	0.18		
Spouses			
Hypochondriasis			−0.19
Psychasthenia			−0.18
Social status	0.19	0.22	
Patients minus spouses			
psychasthenia			−0.19
Demographic data (patients)			
Age of patient			−0.18
Physically capable			
of work	0.25	0.19	
Psychologially			
capable of work	0.22		
Other significant			
disease			−0.24
Length of follow-up			0.24
Medical state on			
follow-up		0.48	0.21
Vocational adjustment			
on follow-up	0.21	0.21	
Acceptance of Unit's			
recommendation		0.32	0.23

R 0.18 = p 0.05. R 0.24 = p 0.01.
− indicates negative correlation.

The more severely disabled patients had less education, poor initial vocational adjustment and the incidence of other physical disorders was higher.

When the MMPI variables are correlated with follow-up information concerning medical status, psychological and vocational adjustment, it is found that these variables are not independent and are highly related to each other (Table V).

The results indicate that patients who have made better initial psychological adjustments exhibit greater vocational adjustment. It is also noted that the better the medical status on follow-up, the greater the psychological ability to work and the better the overall vocational adjustment. Younger patients make better vocational adjustments than do older ones. Cautious patients are more likely to show medical improvement. Acceptance of the Unit's recommendations is positively correlated with psychological improvement and better vocational adjustment on follow-up study.

Feelings of adequacy and security in the spouse are associated with better medical and psychological adjustment in patients. The less preoccupied the spouse is with her own physical well-being and the more easy-going she is, the more adequate is her husband's vocational adjustment over a period of time. To summarize the relationship, the better the overall adjustment of the spouse, the better the medical, psychological and vocational progress of the patient.

Eighty-six percent of our patients were judged to be well motivated for work when first seen by the Unit. Despite clinical impressions and the literature emphasizing the relationship between motivation and successful vocational rehabilitation, it was surprising to find no correlation with the three follow-up variables. The explanation may be that our patients came to the Unit seeking assistance specifically directed towards vocational rehabilitation.

DISCUSSION

Gelfand (6) made us aware of the importance of psychological factors in relation to unsuccessful vocational rehabilitation. Post-infarction depression has been described by a number of investigators (3, 7, 8, 12) and the general feeling is that the depression which may persist, is the result of a life-threatening illness. Since our study is a retrospective one, no attempt can be made to interpret the findings in any other light. Ostfeld et al. (10) in a prospective study using the MMPI did not find any personality differences between normal individuals and those who later sustained myocardial infarcts. On the other hand Brozek, Keys & Blackburn (2) in another prospective study found that individuals followed for 14 years and who went on to sustain myocardial infarction scored significantly higher on the Hypochondriasis (Hs) scale of the MMPI as well as showing other psychological differences when compared with those who remained healthy.

Naughton & Bruhn (9) measured psychosocial patterns in 65 patients with myocardial infarction, using 62 age-matched, presumably healthy controls, over a 6 year period. Among other findings they noted feelings of self-deprecation, chronic anger and MMPI scale ratings strikingly similar to those found in our study. During the 6 year period some maintained a consistently elevated depression score while others varied from time to time and some returned to normal. The pattern indicated that while depression was undoubtedly an expected reaction to a life-threating cardiac illness, more patients than controls reacted to subsequent life events with depression.

It is therefore suggested that the depression so frequently observed, may in part be the result of chronic unresolved and cumulative conflicts in life.

From what has been said, it is clear that the illness under discussion may produce long-standing psychological repercussions extending beyond the patient to involve the spouse and probably the entire family. In order to bring about successful rehabilitation, it is not enough to have a motivated patient whose emotional pattern has been investigated but to determine the spouse's strengths and weaknesses so that she may be helped to play a more positive role (5). Evaluation of the spouse should not be limited to psychological testing but should be as comprehensive as possible. Here the role of the social worker cannot be over-emphasized. Once such knowledge becomes available, the need for counselling, not only of the patient but of the spouse too is often obvious. Her contribution may make the difference between success and failure in the rehabilitative process of the patient. Psychotherapy for

patients with myocardial infarction and for their spouses has already been advocated on the basis of short-term uncontrolled results (1) and our findings add statistical weight to the need for this type of help in the population we sampled.

It is also felt that this study confirms the value of the multidisciplinary approach to patients with myocardial infarction. A Cardiac Work Evaluation Unit can be of great help in providing not only the evaluation but the broad support needed to combat depression and isolation. Adequate follow-up should form part of the Unit's activities in order to maintain such support as long as it is needed.

SUMMARY

A group of male patients with proven myocardial infarction chosen from individuals seen by a Cardiac Work Evaluation Unit were studied from social, medical, psychological and vocational points of view. MMPI's were administered to both patients and their spouses. Without the benefit of information later obtained from this screening test, comprehensive advice was given to patients whose progress was then followed. A study of the MMPI data showed the presence of marked depression as well as other emotional disturbances in patients when compared with the general population and with their spouses.

Other studies indicate the presence of depression which, while probably the result of a life threatening illness, may persist for a long time and may be related to previous personality patterns. The study indicates the value of testing both spouse and patient in order to include her in a counselling program which may bring about more successful rehabilitation. The value of a multidisciplinary approach such as can be provided by a work evaluation unit team to facilitate and follow this process is also apparent.

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