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Scand J Rehab Med 16:57-64, 1984

SICK-ROLE AND ATTITUDE TOWARDS DISEASE AND WORKING LIFE
TWO MONTHS AFTER A MYOCARDIAL INFARCTION

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and the 2Department of Medicine, Östra Hospital, Göteborg, Sweden

ABSTRACT. Sick-role and attitude towards disease and work two months after a first myocardial infarction (MI)
were studied in relation to social, psychological and somatic factors prior to, during and after the MI in 201 consecutive
male patients. Questionnaires and a brief interview covered psychological and social data. Somatic data were registered
in a standardized medical examination. New concepts were introduced after factor analysis of the psychological varia-
tables. Two out of three patients displayed avoidance behaviour. Seventy per cent had restricted their everyday ac-
tivities. The leisure time was dominated by passivity. Over-protection was frequent. Sick-role behaviour was signifi-
cantly related to emotional upset, preoccupation with the health and self-reported coronary symptoms while the
shortage of relationships to somatic and cardiac factors was notable. The patients attributed the onset of MI to work-
related factors. Work dissatisfaction was an aspect of a general negative attitude towards life and was more fre-
quent among patients with emotional symptoms. The psychological care ought to be improved in order to prevent
long-term disability.

Key words: Myocardial infarction, emotions, anxiety pec-
tator, sick role, leisure activities, self-assessment, reha-
Bilitation, factor analysis

Psychosocial outcome after a myocardial infarction (MI) has frequently been discussed in terms of re-
turn to work (4, 23), emotional reaction (3, 31), or
sexual adjustment (12, 15). The negative effect on readaptation to inactivity (26) and a pessimistic
attitude towards the future (24, 38) have been dem-
strated. The psychological benefits of early mobi-
Ization (1, 11) and physical training (10, 29) have
been recognized. The importance of the family has
been stressed (20). Attitude variables as life dissat-
faction (27), job dissatisfaction (32) and health per-
ception (9) are listed as psychosocial risk factors
in respect of outcome after MI. The patient’s causal
explanation of his MI has been described (6) and
related to behavioural outcome (28). Reports of
adaptation in the sense of everyday-life, leisure-
time activities and social contacts are, however,
rare.

Although many psychosocial factors are related to each other a general measure of outcome is
inadequate. Outcome variables have to be exam-
ined separately since the disability of one patient
is not similar to that of another (21).

The purpose of this study is to describe sick-role
behaviour and attitude towards disease and working
life two months after a first MI in relation to
somnic, social and psychological factors prior to,
during and after the MI.

PATIENTS AND METHODS

Two-hundred and one consecutive male Swedish speak-
king patients between 32 and 60 years with a first MI were
studied. Only patients employed before the onset of MI
and who had not been sick-listed for more than 180 days
were included (34). Myocardial infarction was diagnosed
according to strict criteria (7). Questionnaires were ad-
ministered by a psychologist together with a brief inter-
view about background data 5 to 8 weeks after the MI. A
medical examination by a physician at the Post Myocar-
dial Infarction Clinic (PMIC) was performed three months
after the MI (6). One year after the infarction the patients
were re-investigated. Psychosocial and somatic data from
the time before onset of the acute episode and from the
acute and convalescence phases were registered including
social contacts, everyday and leisure activity. Severity of
the infarction was determined according to a method by
Vedin (23). New psychological concepts, over-protection,
assistance behaviour, causal explanation of MI, work sat-
isfaction and working pace, were created by factor analy-
sis (Table I). Applicable parts of the questionnaires were
presented as a comparison to a non-selected group of 175
healthy, Swedish-speaking, able-bodied men aged be-
tween 40 and 50 years who were involved in a population
study (35). A complete methodological account has been
given earlier (34).

Statistical methods
Standard statistical programs were used to calculate
means, standard deviations and product-moment correla-

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Table II. Response to the question “How do you spend your leisure time?” (MI patients N = 201 and reference group N = 175)

<table>
<thead>
<tr>
<th>Activity</th>
<th>MI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watching television</td>
<td>58</td>
</tr>
<tr>
<td>Family life</td>
<td>45</td>
</tr>
<tr>
<td>Taking walks</td>
<td>34</td>
</tr>
<tr>
<td>Reading books</td>
<td>28</td>
</tr>
<tr>
<td>Resisting</td>
<td>28</td>
</tr>
<tr>
<td>Eating guests</td>
<td>12</td>
</tr>
<tr>
<td>Going to parties</td>
<td>13</td>
</tr>
<tr>
<td>Going to the countryside</td>
<td>12</td>
</tr>
<tr>
<td>Outdoor life</td>
<td>7</td>
</tr>
<tr>
<td>Reading specialist literature</td>
<td>7</td>
</tr>
<tr>
<td>Going to the cinema</td>
<td>2</td>
</tr>
<tr>
<td>Clubs and associations</td>
<td>4</td>
</tr>
<tr>
<td>Courses</td>
<td>1</td>
</tr>
</tbody>
</table>

Table III. Response to the question “What factors do you avoid because of your MI?” (MI patients N = 201)

<table>
<thead>
<tr>
<th>Activity</th>
<th>MI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snacks/baths</td>
<td>67</td>
</tr>
<tr>
<td>Alcohol intake</td>
<td>51</td>
</tr>
<tr>
<td>Driving a car</td>
<td>28</td>
</tr>
<tr>
<td>Travelling by air</td>
<td>24</td>
</tr>
<tr>
<td>Going to the countryside</td>
<td>16</td>
</tr>
<tr>
<td>Being alone</td>
<td>13</td>
</tr>
</tbody>
</table>

In response to the question “What is your attitude towards the future?” 55% had an optimistic outlook towards the future, 39% were indifferent and 6% pessimistic.

Leisure-time activity
Leisure-time activity should be expected to differ between the MI and reference groups since the patients were sick-listed (Table II).

Sedentary activities as resting, reading books and watching television were over-represented among the patients, while the leisure time of the reference group was varied, extrovert and work related with more emphasis on physical activity.

When the items in Table II were factor analyzed no obvious factor came out. This could be due to limitations of the questionnaire and general difficulties in the measurement of leisure-time activity.

Avoidance behaviour
After the MI many patients displayed avoidance behaviour (Table III). Two avoidance patterns (Table IV) were distinguished after factor analysis of the items in Table III. Avoidance of being alone constituted an aspect of its own.

Overprotection
Not only the patient but also members of his family and friends were anxious and concerned (Table IV).

An index of Overprotection (Table I) was created after factor analysis of the items in Table IV.

In spite of the apparent overprotection not more than 27% considered themselves treated in a different way after the MI.

Sick-role behaviour
The previous factors altered ways of daily living, restricted behaviour patterns e.g. avoidance, a leisure-time dominated by passivity and/or caution and an overprotective attitude on behalf of the MI patient’s family reflected various aspects of sick-role and sick-role behaviour as well as the patient’s attitude towards the future and his present life situation.

Altered ways of daily living were related to emotional factors and had no relation at all to past or present somatic illness or cardiac symptoms assessed by the physician (Table V).

The different aspects of avoidance behaviour were interrelated. Avoiding walks in the woods and...
Table II. Response to the question “How do you spend your leisure time?” (MI patients N = 201 and reference group N = 175)

<table>
<thead>
<tr>
<th>Activity</th>
<th>MI (N=201)</th>
<th>Reference (N=175)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watching television</td>
<td>38 (57%)</td>
<td>61 (57%)</td>
</tr>
<tr>
<td>Family life</td>
<td>45 (69%)</td>
<td>39 (69%)</td>
</tr>
<tr>
<td>Taking walks</td>
<td>34 (53%)</td>
<td>23 (53%)</td>
</tr>
<tr>
<td>Reading books</td>
<td>38 (55%)</td>
<td>21 (55%)</td>
</tr>
<tr>
<td>Visiting</td>
<td>28 (43%)</td>
<td>6 (43%)</td>
</tr>
<tr>
<td>Going to parties</td>
<td>14 (22%)</td>
<td>3 (22%)</td>
</tr>
<tr>
<td>Going to the country house</td>
<td>20 (30%)</td>
<td>27 (30%)</td>
</tr>
<tr>
<td>Outdoor life</td>
<td>7 (11%)</td>
<td>11 (11%)</td>
</tr>
<tr>
<td>Reading specialist literature</td>
<td>7 (11%)</td>
<td>9 (11%)</td>
</tr>
<tr>
<td>Going to the cinema</td>
<td>2 (3%)</td>
<td>4 (3%)</td>
</tr>
<tr>
<td>Clubs and associations</td>
<td>4 (6%)</td>
<td>5 (6%)</td>
</tr>
<tr>
<td>Courses</td>
<td>1 (2%)</td>
<td>6 (2%)</td>
</tr>
</tbody>
</table>

The difference between MI and reference group is significant, p<0.001.

Table III. Response to the question “What factors do you avoid because of your MI?” (MI patients N = 201)

<table>
<thead>
<tr>
<th>Activity</th>
<th>MI (%)</th>
<th>Reference (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sauna baths</td>
<td>67 (33%)</td>
<td>13 (33%)</td>
</tr>
<tr>
<td>Alcohol intake</td>
<td>51 (25%)</td>
<td>26 (25%)</td>
</tr>
<tr>
<td>Driving a car</td>
<td>28 (40%)</td>
<td>40 (40%)</td>
</tr>
<tr>
<td>Walking by air</td>
<td>43 (10%)</td>
<td>16 (10%)</td>
</tr>
<tr>
<td>Going to the country side</td>
<td>16 (37%)</td>
<td>16 (37%)</td>
</tr>
<tr>
<td>Being alone</td>
<td>13 (37%)</td>
<td>13 (37%)</td>
</tr>
</tbody>
</table>

In response to the question “What is your attitude towards the future?” 55% had an optimistic outlook towards the future, 39% were indifferent and 6% pessimistic.

Leisure-time activity
Leisure-time activity should be expected to differ between the MI and reference groups since the patients were sick-listed (Table II).

Sedentary activities as resting, reading books and watching television were over-represented among the patients, while the leisure time of the reference group was varied, extrovert and work related with more emphasis on physical activity.

When the items in Table II were factor analyzed no obvious factor came out. This could be due to limitations of the questionnaire and general difficulties in the measurement of leisure time activity.

Avoidance behaviour
After the MI many patients displayed avoidance behaviour (Table III). Two avoidance patterns (Table IV).

Table IV. Response to the question “How are you treated by your family and friends after the MI? (MI patients N = 201)

<table>
<thead>
<tr>
<th>Activity</th>
<th>MI (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protected from physical exertion</td>
<td>80 (40%)</td>
</tr>
<tr>
<td>Treated with understanding</td>
<td>68 (34%)</td>
</tr>
<tr>
<td>Showed consideration</td>
<td>67 (33%)</td>
</tr>
<tr>
<td>Given practical help</td>
<td>62 (31%)</td>
</tr>
<tr>
<td>Green good advice</td>
<td>49 (25%)</td>
</tr>
<tr>
<td>My responsibility is taken away</td>
<td>47 (23%)</td>
</tr>
<tr>
<td>Shown compassion</td>
<td>36 (18%)</td>
</tr>
<tr>
<td>Overprotected</td>
<td>23 (12%)</td>
</tr>
<tr>
<td>My initiative is taken away</td>
<td>14 (7%)</td>
</tr>
<tr>
<td>Treated as an invalid</td>
<td>10 (5%)</td>
</tr>
</tbody>
</table>

The differences in avoidance behaviour were interrelated. Avoiding walks in the woods and...
going into the countryside were related to health preoccupation, overprotection and severity of the infarction (p<0.01). Avoidance of being alone was primarily associated with emotional distress (p<0.001), health preoccupation (p<0.001) and neurotic traits according to Eyenstek Personality Inventory (p<0.001).

Overprotected patients were more often health preoccupied (p<0.001), emotionally distressed (p<0.001) and they were more likely to have changed their daily routines (p<0.001).

Both pessimism and dissatisfaction with present life situation were associated with psychological factors (Tables VI and VII). Pessimism was associated with a general attitude of giving up with a lowered work motivation and work satisfaction and seemed to have generated out of factors in existence before the MI.

The shortage of relationships between sick-role behaviour and somatic illness and coronary symptoms was remarkable.

Causal explanation of MI

Work related factors were the most frequent explanatory causes of MI. Smoking, an established risk factor in relation to CHD, was less often mentioned although 76% of the patients were smokers at the onset of MI. The healthy subjects regarded many more factors as potential risk factors, e.g. eating and drinking habits and conflicts at work or in the family compared to the MI patients (Table VIII).

By factor analysis of the items in Table VII three patterns, work dissatisfaction, work demands and habits of living as a cause of MI emerged (Table I). Work dissatisfaction in a cause of MI was related to discontent with the work situation (p<0.05) and to a low work motivation (p<0.01). Work load as an explanatory cause was related to a hectic work situation (p<0.001), high socioeconomical status (p<0.01) and previous somatic morbidity (p<0.001). Habits of living as a cause of MI were related to smoking (p<0.01) and a high tobacco consumption (p<0.001).

Attitude towards work

Both the MI and the reference group seemed to be content with their work situation (Table IX). The MI patients described their work as physically more heavy and their work situation as more hectic, irregular and boring in comparison to the reference group.

The MI patients and the healthy subjects were asked “What does painful work mean to you except from the salary?” Comradeliness, improved self-esteem, variety and stimulation were emphasized very much by 60% to 70% of the MI patients and the reference group. Patient oriented answers as “for reasons of health” and “not feeling like a disabled person” were mentioned by 47% and 37% of the patients compared to 46% and 26% in the reference group.

In both groups 80% declared that to be able to work was an important aspect of the emotional and physiological well-being. Only 6 patients and 2 members of the reference group claimed that their ability to work was of no or inconceivable significance. When asked about worries in the future 25% were very much concerned about their future working capacity and another 45% worried somewhat about it.

Three work related factors, work satisfaction, time urgency and physical work load became apparent when the work conditions were factor analysed (Table I).

Work dissatisfaction was associated with emotional problems before, during and after the MI and with restricted behaviour and pessimism (Table X). There was also a relationship to self-reported coro-

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**Table VII. Significant relationships (p<0.05) between factors prior to, during and after MI and a pessimistic attitude towards the future**

<table>
<thead>
<tr>
<th>Correlation coefficient</th>
<th>Factors prior to MI</th>
<th>0.16</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Somatic illness</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>Somatic symptoms</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>Previous emotional complaints</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>Marital status (single)</td>
<td>0.15</td>
</tr>
<tr>
<td><strong>Factor during MI</strong></td>
<td>0.22** Use of psychoactive drug</td>
<td>0.22**</td>
</tr>
<tr>
<td><strong>Factors after MI</strong></td>
<td>0.33** Neurotic traits</td>
<td>0.33**</td>
</tr>
<tr>
<td></td>
<td>0.29** Emotional instability</td>
<td>0.29**</td>
</tr>
<tr>
<td></td>
<td>0.26** Work dissatisfaction</td>
<td>0.26**</td>
</tr>
<tr>
<td></td>
<td>0.24** Use of psychoactive drugs</td>
<td>0.24**</td>
</tr>
<tr>
<td></td>
<td>0.23** Subj. limiting emotional symptoms</td>
<td>0.23**</td>
</tr>
<tr>
<td></td>
<td>0.21** Dissatisfaction with present life</td>
<td>0.21**</td>
</tr>
<tr>
<td></td>
<td>0.19** Health preoccupation</td>
<td>0.19**</td>
</tr>
<tr>
<td></td>
<td>0.16 Low work motivation</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>0.16 Frequency of angina pectoris</td>
<td>0.16</td>
</tr>
<tr>
<td></td>
<td>0.15 Physical heavy work</td>
<td>0.15</td>
</tr>
</tbody>
</table>

**p<0.01, ***p<0.001

---

**Table VIII. Response to the question “What factors do you think caused/cause your myocardial infarction?” (MI patients N = 201 and reference group N = 175)**

<table>
<thead>
<tr>
<th>MI</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very much (%)</td>
<td>To some extent (%)</td>
</tr>
<tr>
<td>Time urgency at work</td>
<td>46</td>
</tr>
<tr>
<td>Responsibilities at work</td>
<td>35</td>
</tr>
<tr>
<td>Living work conditions</td>
<td>34</td>
</tr>
<tr>
<td>Smoking</td>
<td>28</td>
</tr>
<tr>
<td>Eating habits</td>
<td>7</td>
</tr>
<tr>
<td>Physical heavy work</td>
<td>12</td>
</tr>
<tr>
<td>Irregularity</td>
<td>7</td>
</tr>
<tr>
<td>Conflicts at work</td>
<td>7</td>
</tr>
<tr>
<td>Drinking habits</td>
<td>3</td>
</tr>
<tr>
<td>Unpleasant work conditions</td>
<td>5</td>
</tr>
<tr>
<td>Conflicts in the family</td>
<td>7</td>
</tr>
<tr>
<td>Tidious work situation</td>
<td>2</td>
</tr>
</tbody>
</table>

---

**Table IX. Response to the question “How do you experience your work situation and work environment?” (MI patients N = 201 and reference group N = 175)**

<table>
<thead>
<tr>
<th>MI</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very much (%)</td>
<td>To some extent (%)</td>
</tr>
<tr>
<td>Full of variety</td>
<td>68</td>
</tr>
<tr>
<td>Good work management</td>
<td>68</td>
</tr>
<tr>
<td>Responsible</td>
<td>68</td>
</tr>
<tr>
<td>Stimulating</td>
<td>66</td>
</tr>
<tr>
<td>Pleasant work environment</td>
<td>64</td>
</tr>
<tr>
<td>Hectic</td>
<td>61</td>
</tr>
<tr>
<td>Irregular</td>
<td>59</td>
</tr>
<tr>
<td>Physically heavy</td>
<td>19</td>
</tr>
</tbody>
</table>

**The difference between MI and ref. group is significant p<0.01.

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**Table X. Significant relationships (p<0.05) between factors prior to, during and after MI and work dissatisfaction**

<table>
<thead>
<tr>
<th>Correlation coefficient</th>
<th>Factors prior to MI</th>
<th>0.15</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Previous somatic symptoms</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>Previous emotional complaints</td>
<td>0.14</td>
</tr>
<tr>
<td><strong>Factor during MI</strong></td>
<td>0.21** Use of psychoactive drugs</td>
<td>0.21**</td>
</tr>
<tr>
<td><strong>Factors after MI</strong></td>
<td>0.36** Low work motivation</td>
<td>0.36**</td>
</tr>
<tr>
<td></td>
<td>0.36** Work dissatisfaction as a cause of MI</td>
<td>0.36**</td>
</tr>
<tr>
<td></td>
<td>0.29** Subj. frequency of chest pain</td>
<td>0.29**</td>
</tr>
<tr>
<td></td>
<td>0.33** Pessimism</td>
<td>0.33**</td>
</tr>
<tr>
<td></td>
<td>0.27** Neurotic traits</td>
<td>0.27**</td>
</tr>
<tr>
<td></td>
<td>0.25** Physically heavy work</td>
<td>0.25**</td>
</tr>
<tr>
<td></td>
<td>0.23** Emotional instability</td>
<td>0.23**</td>
</tr>
<tr>
<td></td>
<td>0.22** Subj. limiting coronary symptoms</td>
<td>0.22**</td>
</tr>
<tr>
<td></td>
<td>0.18** Subj. limiting emotional symptoms</td>
<td>0.18**</td>
</tr>
</tbody>
</table>

**p<0.01, ***p<0.001

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Table VI. Significant relationships (p<0.05) between factors prior to, during and after MI and a pessimistic attitude towards the future

<table>
<thead>
<tr>
<th>Correlation coefficient</th>
<th>Factors prior to MI</th>
<th>Factors prior to MI</th>
<th>Factors during MI</th>
<th>Factors during MI</th>
<th>Factors after MI</th>
<th>Factors after MI</th>
<th>Factors after MI</th>
<th>Factors after MI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somatic illness</td>
<td>0.16</td>
<td>0.16</td>
<td>0.13</td>
<td>0.13</td>
<td>0.22**</td>
<td>0.22**</td>
<td>0.33**</td>
<td>0.24**</td>
</tr>
<tr>
<td>Somatic symptoms</td>
<td>0.16</td>
<td>0.16</td>
<td>0.15</td>
<td>0.15</td>
<td>0.22**</td>
<td>0.22**</td>
<td>0.33**</td>
<td>0.24**</td>
</tr>
<tr>
<td>Previous emotional complaints</td>
<td>0.13</td>
<td>0.13</td>
<td>0.15</td>
<td>0.15</td>
<td>0.22**</td>
<td>0.22**</td>
<td>0.33**</td>
<td>0.24**</td>
</tr>
<tr>
<td>Marital status (single)</td>
<td>0.13</td>
<td>0.13</td>
<td>0.15</td>
<td>0.15</td>
<td>0.22**</td>
<td>0.22**</td>
<td>0.33**</td>
<td>0.24**</td>
</tr>
<tr>
<td>Physical heavy work</td>
<td>0.15</td>
<td>0.15</td>
<td>0.15</td>
<td>0.15</td>
<td>0.22**</td>
<td>0.22**</td>
<td>0.33**</td>
<td>0.24**</td>
</tr>
</tbody>
</table>

** p<0.01, *** p<0.001.

Risk factors in relation to CHD was less often mentioned although 76% of the patients were smokers at the onset of MI. The healthy subjects regarded many more factors as potential risk factors, e.g., smoking and drinking habits and conflicts at work or in the family compared to the MI patients (Table VIII).

By factor analysis of the items in Table VII, three patterns were identified: work dissatisfaction, work demands and habits of living as a cause of MI emerged (Table I). Work dissatisfaction in a cause of MI was related to both the work situation (p<0.05) and to a low work motivation (p<0.01). Work load as an explanatory cause was related to a hectic work situation (p<0.001), high socioeconomic status (p<0.01) and previous somatic morbidity (p<0.001). Habits of living as a cause of MI was related to smoking (p<0.01) and high tobacco consumption (p<0.001).

Attitude towards work

Both the MI and the reference group seemed to be in conflict with their work situation (Table IX). The MI patients described their work as physically more heavy and their work situation as more hectic, irregular and boring in comparison to the reference group.

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Three work related factors, work satisfaction, time urgency and physical work load became apparent when the work conditions were factor analysed (Table I).

Work dissatisfaction was associated with emotional problems before, during and after the MI and with restricted behaviour and pessimism (Table X). There was also a relationship to self-reported coronary heart disease (Table XI).

Table VIII. Response to the question “What factors do you think caused/cause your/my myocardial infarction?” (MI patients N = 201 and reference group N = 175)

<table>
<thead>
<tr>
<th>MI</th>
<th>Very much (%)</th>
<th>To some extent (%)</th>
<th>Very much (%)</th>
<th>To some extent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time urgency at work</td>
<td>46</td>
<td>39</td>
<td>61</td>
<td>34</td>
</tr>
<tr>
<td>Responsibilities at work</td>
<td>37</td>
<td>48</td>
<td>23</td>
<td>63</td>
</tr>
<tr>
<td>Working conditions</td>
<td>34</td>
<td>45</td>
<td>54</td>
<td>43</td>
</tr>
<tr>
<td>Smoking</td>
<td>28</td>
<td>40</td>
<td>50</td>
<td>47</td>
</tr>
<tr>
<td>Eating habits</td>
<td>7</td>
<td>49</td>
<td>36</td>
<td>57</td>
</tr>
<tr>
<td>Physical heavy work</td>
<td>12</td>
<td>79</td>
<td>8</td>
<td>33</td>
</tr>
<tr>
<td>Handedness</td>
<td>7</td>
<td>27</td>
<td>9</td>
<td>68</td>
</tr>
<tr>
<td>Conflicts at work</td>
<td>7</td>
<td>22</td>
<td>34</td>
<td>52</td>
</tr>
<tr>
<td>Drinking habits</td>
<td>3</td>
<td>20</td>
<td>22</td>
<td>59</td>
</tr>
<tr>
<td>Unpleasant work conditions</td>
<td>5</td>
<td>18</td>
<td>31</td>
<td>52</td>
</tr>
<tr>
<td>Conflicts in the family</td>
<td>7</td>
<td>15</td>
<td>31</td>
<td>52</td>
</tr>
<tr>
<td>Tidious work situation</td>
<td>2</td>
<td>15</td>
<td>11</td>
<td>45</td>
</tr>
</tbody>
</table>

Table IX. Response to the question “How do you experience your work situation and work environment?” (MI patients N = 201 and reference group N = 175)

<table>
<thead>
<tr>
<th>MI</th>
<th>Very much (%)</th>
<th>Ref.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full of variety</td>
<td>68</td>
<td>72</td>
</tr>
<tr>
<td>Good work management</td>
<td>68</td>
<td>69</td>
</tr>
<tr>
<td>Responsible</td>
<td>68</td>
<td>67</td>
</tr>
<tr>
<td>Stimulating</td>
<td>66</td>
<td>70**</td>
</tr>
<tr>
<td>Pleasant work environment</td>
<td>64</td>
<td>68</td>
</tr>
<tr>
<td>Hectic</td>
<td>61</td>
<td>43**</td>
</tr>
<tr>
<td>Irregular</td>
<td>59</td>
<td>47**</td>
</tr>
<tr>
<td>Physically heavy</td>
<td>19</td>
<td>9**</td>
</tr>
</tbody>
</table>

** p<0.01, *** p<0.001.

Table X. Significant relationships (p<0.05) between factors prior to, during and after MI and work dissatisfaction

<table>
<thead>
<tr>
<th>Correlation coefficient</th>
<th>Factors prior to MI</th>
<th>Factors prior to MI</th>
<th>Factors after MI</th>
<th>Factors after MI</th>
<th>Factors after MI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somatic illness</td>
<td>0.16</td>
<td>0.16</td>
<td>0.22**</td>
<td>0.22**</td>
<td>0.33**</td>
</tr>
<tr>
<td>Somatic symptoms</td>
<td>0.16</td>
<td>0.16</td>
<td>0.22**</td>
<td>0.22**</td>
<td>0.33**</td>
</tr>
<tr>
<td>Previous emotional complaints</td>
<td>0.13</td>
<td>0.13</td>
<td>0.22**</td>
<td>0.22**</td>
<td>0.33**</td>
</tr>
<tr>
<td>Marital status (single)</td>
<td>0.13</td>
<td>0.13</td>
<td>0.22**</td>
<td>0.22**</td>
<td>0.33**</td>
</tr>
<tr>
<td>Physical heavy work</td>
<td>0.15</td>
<td>0.15</td>
<td>0.22**</td>
<td>0.22**</td>
<td>0.33**</td>
</tr>
</tbody>
</table>

** p<0.01, *** p<0.001.

Causal explanation of MI

Work related factors were the most frequent explanatory causes of MI. Smoking, an established risk factor in relation to CHD, was less often mentioned although 76% of the patients were smokers at the onset of MI. The healthy subjects regarded many more factors as potential risk factors, e.g., eating and drinking habits and conflicts at work or in the family compared to the MI patients (Table VIII).

Overprotected patients were more often health preoccupied (p<0.001), emotionally distressed (p<0.001) and neurotic traits according to Eysenck Personality Inventory (p<0.001). Overprotected patients were more often health preoccupied (p<0.001), emotionally distressed (p<0.001) and neurotic traits according to Eysenck Personality Inventory (p<0.001). Both pessimism and dissatisfaction with present life situation were associated with psychological factors (Tables VI and VII). Pessimism was associated with a general attitude of giving up with a lowered work motivation and work satisfaction and seemed to have generated out of factors in existence before the MI.

The shortage of relationships between sick-role behaviour and somatic illness and coronary symptoms was remarkable.

Causal explanation of MI

Work related factors were the most frequent explanatory causes of MI. Smoking, an established risk factor in relation to CHD, was less often mentioned although 76% of the patients were smokers at the onset of MI. The healthy subjects regarded many more factors as potential risk factors, e.g., eating and drinking habits and conflicts at work or in the family compared to the MI patients (Table VIII).

By factor analysis of the items in Table VII, three patterns were identified: work dissatisfaction, work demands and habits of living as a cause of MI emerged (Table I). Work dissatisfaction in a cause of MI was related to both the work situation (p<0.05) and to a low work motivation (p<0.01). Work load as an explanatory cause was related to a hectic work situation (p<0.001), high socioeconomic status (p<0.01) and previous somatic morbidity (p<0.001). Habits of living as a cause of MI was related to smoking (p<0.01) and high tobacco consumption (p<0.001).

Attitude towards work

Both the MI and the reference group seemed to be in conflict with their work situation (Table IX). The MI patients described their work as physically more heavy and their work situation as more hectic, irregular and boring in comparison to the reference group.

The MI patients and the healthy subjects were asked: “What does painful work mean to you except from the salary?” Comradeship, improved self-esteem, variety and stimulation were emphasized very much by 40% to 76% of the MI patients and the reference group. Patient oriented answers as “for reasons of health” and “not feeling like a disabled person” were mentioned by 47% and 37% of the patients compared to 40% and 26% in the reference group. In both groups 80% declared that to be able to work was an important aspect of the emotional and psychological well-being. Only 6 patients and 2 members of the reference group claimed that their ability to work was of no or inconsequential significance. When asked about worries in the future 25% were very much concerned about their future working capacity and another 45% worried somewhat about it.

Three work related factors, work satisfaction, time urgency and physical work load became apparent when the work conditions were factor analysed (Table I).

Work dissatisfaction was associated with emotional problems before, during and after the MI and with restricted behaviour and pessimism (Table X). There was also a relationship to self-reported coronary heart disease (Table XI).
The patient was met by an overprotective attitude of his family and friends which might reinforce sick-role behaviour as well as anxiety, dif-
culty and insecurity. The fact that only a minority felt differently treated after the MI might be due to inability to recognize alterations regarding the own person. It has been described how the family was about how to behave (19, 30). The role of the wife as a major determinant of the patient's readjustment during convalescence has been indi-
cated (20). Not only the patient but also his family are in need of counseling and information about how to behave and the long-term implications of the illness.

The patient's causal explanation of his MI de-
serves attention. The present results demonstrated a strong association with the work situation. It has been reported that male Swedish MI patients exclu-
sively related their periods of stress to their work-

ing conditions (25). Tension at work, at home or in general was the most common causal explanation used by MI patients in another report (28). The MI patients seemed to answer out of personal reasons emphasizing attribution of MI to work related fac-
tors while the reference group mentioned many more general explanatory causes of a heart attack.

It could be expected that smokers would deny smoking as a cause of MI thus putting the blame outside themselves. The fact that the MI patients, a majority of them were smokers before the MI, men-
tioned smoking less often than the reference group might reflect a tendency to underestimate the signifi-
cance of smoking in relation to MI.

Work dissatisfaction was equal to a more gen-
aral, negative, pessimistic and discontented attitude towards work which occurred in patients inclined to have emotional symptoms. Lack of work satisfac-
tion among MI patients in comparison with controls has been reported (14, 32). The significance of work dissatisfaction has led to a place among the psycho-

somatic restrictions. Poor readjustment in associa-
tion with emotional factors may be considered as inadequate patient care. To reach an optimal level of restoration MI patients should be directed to the patient’s psychological reaction, attitude and sick-

behaviour in addition to the cardiac condition.

ACKNOWLEDGMENTS

Sincere thanks to Professor Kjell Hjemry for statistical and methodological advice; to the Greta and Elmar Asker Foundation and the Swedish National Association against Heart and Lung Disease for economic support.

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nary symptoms but not to angina pectoris rated by the physician. Work dissatisfaction and a low work motivation were highly related to each other.

DISCUSSION

Two to three months after onset of the acute epi-

sode was a crucial time considering adjustment and

return to normal life. In the case of disability rehabi-
litation measures have to be arranged. Since one

aim to study the rehabilitation outcome after a heart

attack, patients on long-term sick-leave, pa-

tients retired due to sickness and patients with a

reinforcement were excluded. For the same reason an

upper age-limit was set at sixty years. All patients in

the study were treated in a standardized way at

the PMIC (8).

The leisure time was dominated by passivity and

activities implying physical strain had been aban-
doned. A similar pattern with a decrease of leisure

activities among MJ patients has been described

(22). Altered daily routines and inactivity might

cause feelings of frustration, inferiority and depend-

ence reinforcing the emotional upset. The patient

who spent his convalescence watching television

felt at loss and lacked the structure of life when

unable to work (36). Inactivity and inability to per-

form household activities rather than coronary

symptoms have been described to cause depression

(16, 26).

Behavioural limitations were associated with

self-reported chest pain but not with angina pec-

toris rated by the physician. Otherwise angina per-

se has been described to lead to a reduced exertion

at home and during leisure time and a narrowing of

social relations (18).

Many patients were satisfied with their present

life situation in spite of considerable changes of

everyday life. Survival and health probably had

greater significance than other needs and overlaid

the negative consequences of the MJ. Dissatis-
faction was, however, obvious as regards specific

changes of the daily activities. Maybe the younger

patient was more included to express discontent

since dissatisfaction was related to age. The young-

er the patient the more frustrating the prospect of

future disability and/or a shortened life expectancy.

Disability and restricted behaviour have be-

en expected to be related to the extent of the impair-

ment and to functional limitation due to coronary

symptoms. The low incidence of coronary and somatic

factors in association with sick-leave behaviour is

remarkable. Emotional disturbance, though natural

and logic, is a secondary phenomenon to the diag-

osis of MJ and is quite likely easier to prevent than

somatic restrictions. Poor readjustment in associ-

ation with emotional factors may be considered as

inadequate patient care. To reach an optimal level

of restoration, rehabilitation must be directed to the

patient’s psychological reaction, attitude and sick-

leave behaviour in addition to the cardiac condition.

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tion of cardiovascular deaths and non-final

Sick-role and attitude after myocardial infarction

Scand J Rehab Med 16

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ABSTRACT. One hundred and thirteen patients operated during the years 1971 to 1976, were re-examined at an average of 26.3 months after heart valve replacement. The functional capacity assessed by the NYHA classification improved in about 40% of the patients. About 88% considered their symptoms and well-being to have improved after the operation. In the re-examination, heart size was most often enlarged in patients with mitral valve replacement. The average work load measured in bicycle ergometer test was higher in patients with aortic valve replacement compared to those with mitral valve replacement. In patients with aortic valve replacements, the operation was more effective (34%) than those with mitral valve replacements (37%). The mean age of patients who were working was significantly lower than in patients who were retired. There was a statistically significant relation between the physical working capacity and the working status. The employability assessed by history and clinical findings corresponded well to the actual work situation in individual patients.

Key words: Heart valve prosthesis, work capacity evaluation, exercise test, follow-up studies

Various aspects of the after-effects of heart valve replacement have been investigated in several centres. The clinical and haemodynamic state has been shown to improve considerably (3, 4, 6, 7, 10, 14, 15, 16). Rate of return to work has varied between rather low (4%) to excellent (88%) (3, 7, 8, 11, 13). The number of patients returning to work has been shown to be closely associated with the duration of sick leave before the operation (2, 3, 8, 11, 13). As might be expected, the age of patients has been shown to be directly associated with the return to work (10), while sex seems to have no effect (13). Neither do haemodynamic parameters appear to have any decisive importance.

This study aimed at investigating the long-term results of aortic and mitral valve replacement with special emphasis on working status after the operation.

CLINICAL FINDINGS AND RETURN TO WORK AFTER HEART VALVE REPLACEMENT

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From the Rehabilitation Research Centre of the Social Insurance Institution, Turku, Finland, and the Departments of Surgery and Medicine, University of Turku, Turku, Finland

MATERIAL AND METHODS

Between the years 1971 to 1976, 131 heart valve replacements using Björk-Shiley disc valves were performed at the University Central Hospital in Turku. These operations involved 81 patients with aortic valve replacement (AVR), 43 patients with mitral valve replacement (MVR) and 6 patients with combined mitral and aortic valve replacement (AVR + MVR). A coronary artery by-pass operation was performed as an additional procedure on 5 patients with AVR. The patients were followed up after the operation at the hospital outpatient department.

One hundred and thirteen patients (96% of the total material) were re-examined by an internist at the Rehabilitation Research Centre of the Social Insurance Institution at an average of 26.3 months (9-66 months) after the operation. The follow-up period was somewhat shorter for men (24.5 months) than for women (29.3 months) (Table I). About 60% of the patients came from an urban area.

Two of the 18 patients who were not re-examined had died. 5 patients could not be re-examined because of other diseases and 11 patients, although alive, could not be contacted personally.

The patients were interviewed with regard to their symptoms, need for rehabilitation, use of medication, functional capacity (using the NYHA classifications) and working status before the operation and at present. In addition to a clinical examination, a series of laboratory and functional tests were performed.

ECG was classified according to the Minnesota Code (12). Systolic time intervals (QS, PR, and LVEDV) were measured according to methods described earlier (17). Heart volume was determined according to Keanes and Enar (5). The symptom limited or subjectively maximal exercise test was performed sitting on a bicycle ergometer (Elema ES690) using the triangular method (1). The exercise test was not performed in 14 patients because of unwillingness to participate, other main locomotor diseases, implanted pacemaker or poor general condition.

The PWC and FEV1 were measured according to conventional methods (Godart, Expograph).

Clinical findings and results of laboratory tests were used to assess the patients' employability in their ordinary work and this assessment was compared blindly with the patients' working status at the time of re-examination.