

## Evaluation of the return to work and its duration after myocardial infarction

Seyyed Jalil Mirmohammadi<sup>(1)</sup>, Seyyed Mahmoud Sadr-Bafghi<sup>(2)</sup>,  
Amir Houshang Mehrparvar<sup>(1)</sup>, Marjan Gharavi<sup>(3)</sup>, Mohammad Hossein Davari<sup>(3)</sup>,  
Maryam Bahaloo<sup>(4)</sup>, Mehrdad Mostaghaci<sup>(3)</sup>, Seyyed Ali Sadr-Bafghi<sup>(5)</sup>, Pedram Shokouh<sup>(6)</sup>

### Original Article

#### Abstract

**BACKGROUND:** The evaluation of the ability for return to work among patients after myocardial infarction (MI) is subject to controversy. Understanding various factors, which may affect return to work process, will help in promoting effective communication between physicians and patients. Return to work is dependent on such factors as patients' functional capacity, MI expansion, cardiac muscle function, some psychiatric variables, job satisfaction, economic status, and age. In this study, we aimed to assess the frequency of return to work after first MI attack, and factors affecting it.

**METHODS:** This was a follow-up study performed in Yazd, Iran from September 2007 until September 2010 on 200 patients suffering from their first MI attack. Patients were assessed 6 months and 1-year after MI regarding their cardiac function. Job satisfaction was evaluated by Direct Support Professional job satisfaction questionnaire.

**RESULTS:** Seventy-seven percent of MI patients returned to work after 1-year. Mean time for return to work was  $46.00 \pm 4.12$  days. Sixty percent of patients returned to work during the first 50 days after MI and 50% of them during 40 days after MI. The most common reason for not returning to work was patient's decision.

**CONCLUSION:** This study showed that a considerable numbers of patients returned to work after 1-year. The only factors which affected the rate of return to work were left ventricular function after MI and job satisfaction.

**Keywords:** Myocardial Infarction, Return to Work, Left Ventricular Function, Job Satisfaction

*Date of submission:* 01 Jan 2013, *Date of acceptance:* 26 Jun 2013

#### Introduction

The evaluation of the ability for return to work among patients after myocardial infarction (MI) is subject to controversy. In the studies during 1960s, about 12-28% of MI patients returned to their previous jobs.<sup>1</sup> In the first decade of the 21<sup>st</sup> century, despite many advances in the diagnosis and treatment of MI in the last 40 years, this rate was almost similar to the last century.<sup>2</sup>

It has been estimated that in the European Union, 90 million working days are lost a year due to coronary artery diseases morbidity.<sup>3</sup> Return to work following acute coronary events may have both economic benefits and improve the quality of life.<sup>4</sup> Lack of early

return to work may cause depression.<sup>5</sup>

Understanding various factors, which may affect return to work process will help in promoting effective communication between physicians and patients.<sup>6</sup> Return to work is dependent on such medical factors as patient's functional capacity, MI expansion, cardiac muscle function, some psychiatric variables (e.g., anxiety and depression)<sup>7</sup> and some non-medical factors, for example, job satisfaction, economic status,<sup>2</sup> and age, illness perception, history of heart failure, and physician's recommendation.<sup>6</sup> Job satisfaction acts independent from socio-demographic factors.<sup>4</sup> In a study, it was shown that 1-year after returning to work, subjects showed more

1- Associate Professor, Department of Occupational Medicine, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

2- Professor, Department of Cardiology, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

3- Assistant Professor, Department of Occupational Medicine, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

4- PhD Candidate, Industrial Related Diseases Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

5- Cardiologist, Department of Cardiology, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

6- Cardiac Rehabilitation Research Center, Isfahan Cardiovascular Research Institute, Isfahan University of Medical Sciences, Isfahan, Iran

Correspondence to: Mohammad Hossein Davari, Email: drmhdavari@gmail.com

positive affect, and less somatic complaints.<sup>8</sup>

It is estimated that in 40-50% of cases not returning to work cannot be explained by patients' physical limitations.<sup>9</sup> Although physicians pay more attention to the medical factors, psychological and non-medical factors have a significant effect on return to work.<sup>10,11</sup> Some studies have shown that early return to work after MI is safe,<sup>12</sup> but the decision for return to work is yet controversial.

There are few studies in this regard in our country, and since about 50% of cases of MI are below 65 years old, the period of employment is an important issue.

This study was designed to assess the frequency of return to work after the first MI attack, and its influencing factors.

### Materials and Methods

This was a follow-up study performed in Yazd, Iran from September 2007 until September 2010. Subjects were 200 patients younger than 65 years old suffering from their first MI attack who were employed before MI and were followed for 1-year. A questionnaire including demographic data, economic status, and occupational information was filled for each subject. For evaluating cardiac muscle function, echocardiography was performed for each subject after MI (device: GE vivid 7, USA). Job satisfaction was evaluated by Direct Support Professional job satisfaction questionnaire.

Data were analyzed by SPSS for Windows (version 17, SPSS Inc., Chicago, IL, USA) using Student's t-test and chi-square test. Level of significance was set at 0.05. An informed consent was obtained from each subject. This study was approved by Ethics Committee of Shahid Sadoughi University of Medical Sciences (Yazd, Iran).

### Results

One hundred and seventy-four cases (out of 200 cases) returned for follow-up. From these subjects, 134 cases (77%) returned to work after 1-year.

Mean ( $\pm$  standard deviation) time for return to work was  $46.00 \pm 4.12$  days. Sixty percent of patients returned to work during the first 50 days after MI and 50% of them during 40 days after MI. The most common reason for not returning to work was patient's decision. Table 1 shows the frequency of different reasons for not returning to work. Among those who returned to work, most subjects returned to their previous job (99.2%).

**Table 1.** Frequency of reasons for not returning to work

| Reason                     | Number | Percent |
|----------------------------|--------|---------|
| Retirement                 | 4      | 10.0    |
| Physician's order          | 3      | 7.5     |
| Physician's recommendation | 9      | 22.5    |
| Patient's decision         | 18     | 45.0    |
| Disease complications      | 1      | 2.5     |
| Dismissal                  | 1      | 2.5     |
| Unknown                    | 4      | 10.0    |

There was not any significant difference in return to work between shift workers and others ( $P = 0.670$ ). Regular exercise before MI had a positive effect on return to work, so as 86.7% of those with previous regular exercise history returned to work, compared to 78.3% of those without regular exercise, but the difference was not statistically significant ( $P = 0.440$ ). Table 2 shows the effect of job satisfaction on return to work. Chi-square test failed to show a significant difference in returning to work according to the level of job satisfaction ( $P = 0.350$ ), although those with a high level of job satisfaction returned to work significantly higher than those with low and moderate level of job satisfaction ( $P = 0.027$  and  $P = 0.042$  for comparison with low and moderate levels of satisfaction).

Left ventricular ejection fraction (LVEF) had a significant effect on return to work ( $P = 0.007$ ). Table 3 shows the effect of LVEF on return to work.

Table 4 shows the frequency of return to work in different age groups. In spite of the difference observed, it was not statistically significant ( $P = 0.410$ ).

**Table 2.** Frequency of return to work according to the level of job satisfaction

| Return to work | Job satisfaction |           |           | Total      |
|----------------|------------------|-----------|-----------|------------|
|                | Low              | Moderate  | High      |            |
| Yes, n (%)     | 10 (71.4)        | 71 (74.7) | 43 (84.3) | 124 (77.5) |
| No, n (%)      | 4 (28.6)         | 24 (25.3) | 8 (15.7)  | 36 (22.5)  |

**Table 3.** Frequency of return to work according to left ventricular ejection fraction

| Return to work | LVEF (%)  |           |           | Total     |
|----------------|-----------|-----------|-----------|-----------|
|                | < 40      | 41-50     | > 50      |           |
| Yes, n (%)     | 18 (66.7) | 33 (80.5) | 34 (97.1) | 85 (82.5) |
| No, n (%)      | 9 (33.1)  | 8 (19.5)  | 1 (2.9)   | 18 (17.5) |

LVEF: Left ventricular ejection fraction

**Table 4.** Frequency of return to work according to age

| Return to work | Age (year) |           |           | Total      |
|----------------|------------|-----------|-----------|------------|
|                | ≤ 40       | 41-59     | ≥ 60      |            |
| Yes, n (%)     | 16 (88.9)  | 97 (77.6) | 12 (70.6) | 125 (78.1) |
| No, n (%)      | 2 (11.1)   | 28 (22.4) | 5 (29.4)  | 35 (21.9)  |

Work load before MI did not have a significant effect on return to work ( $P = 0.210$ ). The frequency of return to work was 82.0%, 81.7%, and 66.7% for those with mild, moderate, and heavy work load, respectively.

Drug abuse, smoking, income, and job title did not have any significant effect on return to work ( $P = 0.230, 0.230, 0.620, \text{ and } 0.710$ , respectively).

### Discussion

In the assessment of MI patients for return to work, prognosis, functional capacity, and psychosocial status should be evaluated. Prognosis is defined by such factors as other diseases, electrocardiogram findings, exercise tolerance test, thallium scan, and angiography.<sup>13-15</sup>

LVEF is one of the most important predictors of return to work in these patients. In the present study, more than 95% of subjects with LVEF > 50% returned to work, and there was a significant relationship between LVEF and return to work.

The effect of MI on the quality of life is completely understood. Frequency and time of return to work is a representative of their life quality and economic effects of the disease.

Studies have found a frequency of 63-94%, 58-80%, 85-87%, and 90% for return to work after MI in the USA, Sweden, Belgium, and Denmark, respectively.<sup>16</sup> Our study showed a frequency of 77% for return to work, which is almost consistent with studies in other parts of the world.

Five percent of MI cases are subjects under 40 years old, and 45% are in subjects under 65 years old, so a considerable number of MI patients are in the years of employment; therefore, it may affect personal and social life of the patient and may lead to important socioeconomic outcomes.

Psychosocial factors are among the most important identifiers of return to work and most studies on this issue have shown this relationship in MI patients.<sup>17</sup> Psychological changes after MI are complex and are individualized. Fear from recurrent MI and probable death may prevent the patient from return to work.<sup>18</sup> Most studies show an important effect for psychosocial factors in return to work of MI patients.<sup>17,18</sup> In our study, those with a high level of job satisfaction returned to work more frequently than other workers consistent with some other studies.<sup>4,10,19</sup>

In the current study, office workers were the job group who returned to work most frequently.

Mean time of return to work in this study was 6 weeks, which is similar to the results of other studies. Kovoov et al. in Australia showed that return to work during 2 weeks after MI in low-risk patients comparing 6 weeks in high-risk patients is harmless, and they could not find a significant difference between two groups regarding cardiovascular complications.<sup>20</sup> Another study showed that MI complications are related to the physician's and employee's understanding from disease severity.<sup>13</sup>

In the study conducted by Isaz et al. 24% did not return to work, and there was not a significant difference between these individuals and others regarding LV function, the interval between the onset of pain and percutaneous coronary intervention, and length of hospitalization; although age, marital status and work load significantly affected return to work.<sup>21</sup> Our results were inconsistent with the results of this study, because in our study, the only factor which significantly affected the return to work was LVEF.

Geographical differences have been observed in return to work, which is dependent on the working conditions in each country.<sup>22</sup>

Rehabilitation, age, educational level, and such psychological conditions as depression and anxiety, job satisfaction and comorbidities such as diabetes mellitus have been shown in different studies to be effective in return to work.<sup>16,23,24</sup>

In the current study, patient understands about his (her) disease and physician's advice was the most frequent reasons for not returning to work, which was consistent with Dennis et al. study.<sup>23</sup> In a study in Austria, authors have shown that patients' rehabilitation, age, educational status, social support, and job satisfaction were the factors which were most frequently related to return to work.<sup>14</sup>

To the best of our knowledge, this was the first study in our country about return to work among MI patients; although there were some limitations: in 1-year period, we could only find < 200 individuals and they were employed in different jobs so it may lack the appropriate power to show some associations. The information about subject's job was according to the self-report of the individuals, so we did not have access to the details of their jobs.

### Conclusion

This study showed that a considerable numbers of patients returned to work after 1-year. The only factors which affected the rate of return to work were LV function after MI and job satisfaction

### Conflict of Interests

Authors have no conflict of interests.

### References

1. Wigle RD, Symington DC, Lewis M, Connell WF, Parker JO. Return to work after myocardial infarction. *Can Med Assoc J* 1971; 104(3): 210-2.
2. Brisson C, Leblanc R, Bourbonnais R, Maunsell E, Dagenais GR, Vezina M, et al. Psychologic distress in postmyocardial infarction patients who have returned to work. *Psychosom Med* 2005; 67(1): 59-63.
3. Leal J, Luengo-Fernandez R, Gray A, Petersen S, Rayner M. Economic burden of cardiovascular diseases in the enlarged European Union. *Eur Heart J* 2006; 27(13): 1610-9.
4. Fiabane E, Argentero P, Calsamiglia G, Candura SM, Giorgi I, Scafa F, et al. Does job satisfaction predict early return to work after coronary angioplasty or cardiac surgery? *Int Arch Occup Environ Health* 2013; 86(5): 561-9.
5. Mital A, Desai A, Mital A. Return to work after a coronary event. *J Cardiopulm Rehabil* 2004; 24(6): 365-73.
6. Slebus FG, Jorstad HT, Peters RJ, Kuijjer PP, Willems JH, Sluiter JK, et al. Return to work after an acute coronary syndrome: patients' perspective. *Saf Health Work* 2012; 3(2): 117-22.
7. Bhattacharyya MR, Perkins-Porras L, Whitehead DL, Steptoe A. Psychological and clinical predictors of return to work after acute coronary syndrome. *Eur Heart J* 2007; 28(2): 160-5.
8. Boudrez H, de Backer G. Recent findings on return to work after an acute myocardial infarction or coronary artery bypass grafting. *Acta Cardiol* 2000; 55(6): 341-9.
9. Lewin R. Return to work after MI, the roles of depression, health beliefs and rehabilitation. *Int J Cardiol* 1999; 72(1): 49-51.
10. Mittag O, Kolenda KD, Nordman KJ, Bernien J, Maurischat C. Return to work after myocardial infarction/coronary artery bypass grafting: patients' and physicians' initial viewpoints and outcome 12 months later. *Soc Sci Med* 2001; 52(9): 1441-50.
11. Soderman E, Lisspers J, Sundin O. Depression as a predictor of return to work in patients with coronary artery disease. *Soc Sci Med* 2003; 56(1): 193-202.
12. McBurney CR, Eagle KA, Kline-Rogers EM, Cooper JV, Smith DE, Erickson SR. Work-related outcomes after a myocardial infarction. *Pharmacotherapy* 2004; 24(11): 1515-23.
13. Cherrington CC, Moser DK, Lennie TA, Kennedy CW. Illness representation after acute myocardial infarction: impact on in-hospital recovery. *Am J Crit Care* 2004; 13(2): 136-45.
14. Korzeniowska-Kubacka I, Piotrowicz R. Cardiological rehabilitation-a chance of returning to work. *Med Pr* 2005; 56(4): 325-7.
15. Waszkowska M, Szymczak W. Return to work after myocardial infarction: a retrospective study. *Int J Occup Med Environ Health* 2009; 22(4): 373-81.
16. Hamalainen H, Maki J, Virta L, Keskimaki I, Mahonen M, Moltchanov V, et al. Return to work after first myocardial infarction in 1991-1996 in Finland. *Eur J Public Health* 2004; 14(4): 350-3.
17. DeBusk RF, Dennis CA. Occupational work evaluation of patients with cardiac disease: a guide for physicians. *West J Med* 1982; 137(6): 515-20.
18. Mayou RA, Gill D, Thompson DR, Day A, Hicks N, Volmink J, et al. Depression and anxiety as predictors of outcome after myocardial infarction. *Psychosom Med* 2000; 62(2): 212-9.
19. Saari LM, Judge TA. Employee attitudes and job satisfaction. *Human Resource Management* 2004; 43(4): 395-407.
20. Kovoov P, Lee AK, Carrozzi F, Wiseman V, Byth K, Zecchin R, et al. Return to full normal activities including work at two weeks after acute myocardial infarction. *Am J Cardiol* 2006; 97(7): 952-8.
21. Isaaq K, Coudrot M, Sabry MH, Cerisier A, Lamaud M, Robin C, et al. Return to work after acute ST-segment elevation myocardial infarction in the modern era of reperfusion by direct percutaneous coronary intervention. *Arch Cardiovasc Dis* 2010; 103(5): 310-6.
22. Abbas AE, Brodie B, Stone G, Cox D, Berman A, Brewington S, et al. Frequency of returning to work one and six months following percutaneous coronary intervention for acute myocardial infarction. *Am J Cardiol* 2004; 94(11): 1403-5.
23. Dennis C, Houston-Miller N, Schwartz RG, Ahn DK, Kraemer HC, Gossard D, et al. Early return to work after uncomplicated myocardial infarction. Results of a randomized trial. *JAMA* 1988; 260(2): 214-20.
24. Yonezawa R, Masuda T, Matsunaga A, Takahashi Y, Saitoh M, Ishii A, et al. Effects of phase II cardiac rehabilitation on job stress and health-related quality of life after return to work in middle-aged patients with acute myocardial infarction. *Int Heart J* 2009; 50(3): 279-90.

**How to cite this article:** Mirmohammadi SA, Sadr-Bafghi SM, Mehrparvar AH, Gharavi M, Davari MH, Bahaloo M, et al. **Evaluation of the return to work and its duration after myocardial infarction.** *ARYA Atheroscler* 2014; 10(3): 137-40.