Life Events and Myocardial Infarction in a Developing Society : A Controlled Study

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ABSTRACT : Life events reported to have occurred 12 months before the onset of illness were compared between 100 in-patients who had a first episode of myocardial infarction and equal number of matched control in-patients of non-myocardial infarction. Social Readjustment Rating Scale of Holmes & Rahe was used. Overall, myocardial infarction patients reported significantly more previous events than the control group. Greatest significant differences were found among occupational, health, relationship and financial events. Mean stress score was found much higher in myocardial infarction patients than control patients. The mean duration for all events was 4.91 months before the onset of myocardial infarction and significantly more events were reported during the four weeks immediately before infarction. These findings are consistent with the view that life events have a positive association with the onset of a first episode of myocardial infarction.

INTRODUCTION

Myocardial infarction is the leading cause of death in the developed and developing countries including Bangladesh. The overall mortality of acute myocardial infarction is approximately 15-30%[1]. Sufficient evidence has been accumulated suggesting that it is not just biological factors that are important for the development of myocardial infarction, a wide range of psychological factors is also related with it[2]. Of the psychological factors there is a well established link between life events and the onset of myocardial infarction[3].

A number of case controlled studies reported that stressful life events were experienced with a greater than expected frequency prior to the onset of myocardial infarction in various countries and culture[3-12]. Typically, these events were described as losses or exits, undesirable, uncontrolled, threatening or severe in character. However, there has been large differences in the methods used for collecting and assessing the life events data. Self-perceived psychological stress is also reported as a risk factor for myocardial infarction and there is no decrease in the effect of stress at baseline over time[11,13]. Relative risk of reinfarction or death from reinfarction is significantly associated with acute and chronic events[14]. The differences in the perception of and in the psychological reactions to life events in the real life situation of myocardial infarction patients are related with both the individual coping styles and the highly complex underlying hemodynamical mechanism and understanding of this relationship can form a basis for preventive action15. The present study was designed to assess the pattern of stressful life events in myocardial infarction and to find out the relationship between them.

MATERIALS AND METHODS

A consecutive series of 100 admitted patients of first acute myocardial infarction (MI) from the Institute of Postgraduate Medicine & Research, National Institute of Cardiovascular Diseases and Dhaka Medical College Hospital of Dhaka city over the period of May 1995 to June 1996 were selected as study group. Patients older than 75 years of age, cognitive impairment, MI complicated with CVD were excluded. Diagnosis of MI was based on WHO criteria i.e. presence of any two of the three criteria e.g. typical clinical features, classical electrocardiographic changes and supportive enzymatic evidences16. Their age ranged between 28 and 74 years with a mean of 49 .20 (SD=10.06) years. Thirty six patients were in age group of 46-55 years and only 6 cases were aged below 35 years. Seventy male and 30 were females with a male-female

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ratio 1 : 0. 45. Twenty six were were illiterates. Of the 74 literates, 30 cases were educated from primary to secondary level and graduates were 18 cases. Only 7 cases were found postgraduate. Among the subjects, 30 were service holders, 21 were housewives, 16 were businessmen, 12 were retired, 11 were cultivators, 4 were unemployed and rest were of other occupations. Urban rural distribution were 63 and 37 cases respectively. Fifty seven cases were predominantly of middle income group and only 15 cases belonged higher class. Eighty one cases were married, 11 were widowed and 6 were unmarried. Divorced and separated were 1 case for each.

Another sample of 100 nonmyocardial medical in - patients were collected from the Institute of Postgraduate Medicine & Research and Dhaka Medical College Hospital to form a control group which was matched for age, sex, education, occupation, marital status and socio-economic condition. All the patients of both groups were interviewed by one of the authors after informed consent. In addition to life events, the interview covered sociodemographic variables, physical and mental health status.

Recent life events were assessed by Social Readjustment Rating Scale (SRRS) of Holmes and Rahe17. The time period for which events were recorded was one year prior to the onset of MI and immediately prior to the current evaluation of study group and control group respectively. Individual events were considered according to this scale with considerable modification which was necessary in our socio-economic cultural context. The quantum of events was measured and expressed in Life Change Unit (LCU) score. The events were categorized by the area of activity they involved. The data was processed and comparison was made between the study group and control group. Statistical analysis involved two tailed t-tests and Chi-square tests with Yates' correction for continutiy.

RESULTS

The MI patients and control patients were compared on measures of life events which is shown in Table-I. The MI patients reported a total of 260 events, with a mean of 2.6 (SD = 1.24) for each patient. The control patients reported a total of 111 events with a mean of 1.1 (SD = 0.83). This revealed that overall, the MI patients had reported 2.3 times as many events

as the control patients. The difference was significant at higher level. In comparison of mean LCU score of events, MI patients had almost one and half times higher stress scores than control patients which was highly significant. The mean duration of life events 12 months before the onset of MI was found to be 4.91 (SD = 3.52) months in MI patients and that was 6.23 (SD = 4.26) months for control patients. This difference is also significant. Further analysis of duration of events in month by month revealed that though general increased frequencies for all monthly distribution of events were found in MI patients than control patients, the greatest significant difference was found for one month (P <0.001).

The frequency of life events among the MI patients and control patients are shown in Table-II. The significance of difference between the two populations was tested when appropriate for each event. This analysis indicated that overall increased frequency of events in the MI patients was paralleled by increased frequency of the most of the individual events. For five events the differences were significant at 5% level or better : (1) serious personal illness, (2) serious financial problem or loss , (3) family arguments (4) marital discord, (5) extreme workload. Most of the other events were also reported more frequently in the MI patients, but they occurred too infrequently in either population for differences to achieve statistical significance. Three events were reported more frequently in the control patients than in the MI patients - extreme poverty, unemployment and arrest. For these events also the general frequency was very low and the magnitude of the differences was unimpressive.

In order to explore further possible differences, events were grouped into categories according to the area of social activity. Eight categories were obtained and the findings are set out in Table- III. For each type, frequencies were again calculated and significance of differences were tested. Of these, health, conjugal, occupational, family and financial were significantly higher in MI patients than control patients. In two of the categories, living circumstances and other interpersonal, the pattern was similar, although differences did not achieve statistical significance. The one remaining category, legal events, occurred very infrequently and similar in both the groups.

Table - I : COMPARISON OF MI PATIENTS AND CONTROL PATIENTS ON MEASURES OF LIFE EVENTS*

Measure	MI group	Control group	t test
Total events	2.6 ± 1.24	1.1 ± 0.83	10.0, P < 0.001
LCU score	81. 47 ± 45. 33	56. 94 ± 37. 52	4.15, P < 0.001
Duration in month	4,91 ± 3.52	6.23 ± 4.26	2.40, P <0.02

* Data are expresssed as X ± SD

Table II : FREQUENCY OF INDIVIDUAL LIFE EVENTS

Event	MI group (N=100)	Control group (n=100)	Significance *
1. Serious personal illness	36	14	<0.01
2. Serious financial problem or loss	31	10	<0.01
3. Family arguments	28	9	<0.01
4. Serious chronic illness diagnosed	27	15	NS
5. Marital discord	24	11	<0.05
6. Sex difficulties	17	7	NS
7. Extreme workload	10	1	<0.01
9. Retirement	9	3	NS
8. Serious illness of family member	7	5	NS
10. Family member living home	6	5	NS
11. Trouble with boss	6	1	NS
12. Extreme job dissatisfaction	5	1	NS
13. Extreme poverty	5	6	NS
14. Family member abroad	5	4	NS
15. Change in living conditions	5	3	NS
16. Death of spouse	4	2	NS
17. Business failure	4.	1	NS
18. Robbery, theft or hijack	3	1	NS
19. Second marriage of husband	3	1	NS
20. Problem with neighbours	3	1	NS
21. Problem with associates	3	1	NS
22. Loss of job	3	0	NS
23. Death of family member	2	1	NS
24. Failure to go abroad for employment	2	1	NS
25. Divorce	2	1	NS
26. Threat to personal safety	2	0	NS
27. Lack of family support	1	1	NS
28. Death of parent	1	1	NS
29. Unemployment	1	2	NS
30. Law suit	1	1	NS
31. Extramarital relationship of husband	1	0	NS
32. Marital separation	1	0	NS
33. Broke up of love affairs	1	0	NS
34. Trial	1	0	NS
35. Arrest	0	1	NS

* X^2 with Yate's correction

Table- III : LIFE EVENTS GROUPED BY AREA OF ACTIVITY

Category	MI group (N=100)	Control group (N=100)	Significance *	Events included in category
Health	72	32	<0.001	Serious personal illness Serious chronic illness diagnosed Serious illness of family member
Conjugal	52	22	<0.001	Discord Second marriage of husband Extramarital relationship of husband Separation Divorce Sex difficulties Death of spouse
Occupational	38	13	<0.001	Retirement Unemployment Joss of job Extreme work load Trouble with boss Extreme job dissatisfaction Failure to go abroad for employment Business failure
Family	38	17	<0.01	Arguments Lack of support Death of parent Death of family member Family member living home
Financial	36	14	<0.01	Serious financial problem or less Extreme poverty
Living circumstances	15	8	NS	Threat to personal safety Robbery, theft or hijack Family member abroad Change in living condition
Other interpersonal	7	3	NS	Broke up of love affairs Problem with neighbour Problem with associates
Legal	2	2	NS	Arrest Law suit Trial

* X2 with Yates' correction

DISCUSSION :

In this study, SRRS was used to measure the stressful life events. This scale was not standardized to our socio-cultural setting, hence some difficulties were experienced during their administration on subject. It contains some events which are not to be considered as stressful or not well known to this culture and lacks many events which are perceived as stressful in this setting. Again some events with high LCU scores are actually not so severe in our society. Reverse is also true in cases of some other events. Though considerable modification was done to overcome some gross anomaly, yet existence of limitation of the scale to measure life events in the subjects may not be overcome.

In the present study, the increased frequency and higher mean score of life events in MI patients than control patients (P < 0.001) clearly showed greater tendency for accelerated occurrence of stressful events in MI patients before the onset of infarction. This result is consistent with the reports of different studies which indicate that life events are frequently assocated with MI[3-11]. In a similar type of case control study, Magni et al[10] observed that MI patients reported significantly more previous events than control group (P < 0.001) by using Paykel interview for recent life events. In another study, Bhatia et al[12] reported that patients with MI scored significantly higher on mean frequency and stress scores on total evens as well as on various subgroups of life events than that with control patients.

In our study, though overall increased frequency of the individual events was found in MI patients than control patients, five events, serious personal illness, serious financial problem or loss, family arguments, marital discord and extreme work load, had significant differences. These findings are more or less consistent with other reports where these events were designated as undesirable, uncontrolled and traumatic[7,10-12]. Moreover, the highest frequency of serious personal illness events in patients with MI in our study were certainly due to associated risk factor diseases. However, for many of the events, frequencies in both groups were too low for reliable conclusion.

The result obtained by combining events into categories therefore particularly revealing. This analysis revealed that except legal, all the types of events were in fact more frequent in the MI patients and most of them reached the higher level of significance. Greatest difference was found among conjugal and occupational events which indicates that physical, occupational and relationship problems are the main events significantly associated with MI.

Overall, there was significant difference in duration of life events in 12 months before the onset of MI or current evaluation between MI and control patients, in our study. Most of the events reported by the MI patients were significantly earlier than control patients. The finding is very much indicative of causal relationship between life events and MI.

Reddy et al [18] observed that the severity of MI, the personality, social background, stressful events preceding the onset of infarction and the psychological reaction occurring in the hospital were correlated with the psychological, social and physical recoveries and all three were independently influenced by different biopsychosocial factors. Those who experienced more stressful life events before the onset of MI and who showed more anxiety, depression and less denial during hospital stay developed psychological morbidity. Therefore, it is clear that liaison approach is essential for obtaining the better recovery of MI patients.

The resutl of this study points to that stressful life events has a definite causal relationship with MI. Morevoer, they point to the better definition of certain types of events which are particularly important in this respect. The use of life event information could play an important role in treatment and prevention of myocardial infarction.

16   Life Events and Myocardial Infarction in a Developing Society
Mullick et al
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