FREQUENCY OF ANXIETY AND PSYCHOSOCIAL STRESSFUL EVENTS IN PATIENTS WITH ACUTE MYOCARDIAL INFRACTION

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Background: The impact of psychological factors in acute coronary events is only now emerging. A growing body of evidence attests to the influence of emotional and stress-related psychosocial factors in the aetiology of Coronary Artery Disease (CAD) and morbidity and mortality among individuals with coronary heart disease. The objectives were to look for the frequency of anxiety and psychosocial stressful events in patients with acute myocardial infarction. **Methods:** Two hundred consecutive patients of Acute Myocardial Infarction (AMI) without complications who presented to the Coronary Care Unit of Cardiology Department, Lady Reading Hospital Peshawar, and 200 healthy controls among relatives of patients were assessed on Holmes Rahe Social scale (HRS) and Hospital Anxiety and Depression Scale (HADS) scale for the presence of anxiety and stressful life events in period preceding AMI. **Results:** Sixty-three percent of the patients were male in both groups. Mean age of patients was 59 years while that of controls was 52 years. For scores of anxiety on HADS, 34% of the controls had normal score compared to of the 19% AMI group ($p<0.001$), while 57% of the AMI patients had abnormal score compared to 39% of the control group ($p<0.001$). The number events reported on HRS scale in patients with AMI were significantly more (4.2±2) compared to the number of events (2.7±1.6) in the control group with ($p<0.001$). Scores for the number of events on HRS scale were significantly less (98±64) in controls compared to (158±5.8) in group with AMI ($p<0.001$). Anxiety was diagnosed in 70% of the female patients compared to 50% of the male patients. **Conclusion:** Significant number of patients with acute myocardial infarction when assessed on standard scales had anxiety and stressful life events in the weeks preceding the event. These were more common in female than male patients.

Keywords: Anxiety, Stress, Myocardial Infarction, Coronary, HADS

INTRODUCTION

The impact of psychological factors in acute coronary events is only now emerging.[1,2] A growing body of evidence attests to the influence of emotional and stress-related psychosocial factors in the aetiology of Coronary Artery Disease (CAD) and morbidity and mortality among individuals with coronary heart disease.[3,4] Systematic reviews have concluded that the firmest evidence to date is for an influence of low socioeconomic status, work stress, social isolation, and depression on CAD.[5–8]

The effects of anxiety immediately preceding Acute Myocardial Infarction (AMI) are under studied. Some authors have demonstrated that anxiety is an independent predictor of coronary artery disease events. Longitudinal studies have found that initially healthy patients with elevated levels of anxiety have increased incidence of coronary artery disease and acute cardiovascular events.[9]

A local study has documented that life full of psychosocial stresses and anxiety are associated with the development of depression and anxiety after acute myocardial infarction, both associated with worst prognosis.[10] Patients with AMI with high level of anxiety had 4.9 times greater risk than patients with lower anxiety of developing recurrent ischemia, re-infarction, ventricular tachycardia, or ventricular fibrillation during hospitalisation.[11] The positive association of high levels of subjective mental stress and anxiety in the 2–4 weeks preceding acute myocardial infarction has been well documented by others.[12]

Although there is negative impact of depression and anxiety on the patient's ability to cope,[13,14] but a large number of patients receive little structured help to deal with distress in hospital. Patients are referred to a cardiac rehabilitation program, on the discharge, but there is a lack of psychological assessment and rehabilitation.

To look into this important predictor of outcome in our part of the world, the present study was designed to measure the frequency anxiety and stressful life events in patients of acute myocardial infarction.

MATERIAL AND METHODS

This descriptive study was conducted in the Cardiology Department of a large tertiary care hospital from March to May 2008. Consecutive patients of age above 20 years and either sex admitted in the coronary care unit with diagnosis of their first acute ST elevation myocardial infarction were enrolled in the study. The diagnosis of AMI was made according to WHO criteria. Two of the following were required for diagnosis: history of typical chest pain, characteristic electrocardiographic changes, and a serial increase in

creatine phosphokinase (CPK) to greater than twice normal limits. Sample of 400 was taken consisting of 200 patients of acute myocardial infarction and 200 active controls among the patients' attendants. Patients with established CAD, re-infarction, Non-ST Elevation Myocardial Infarction (NSTEMI), unstable angina, critically ill patient unable to be interviewed, and those having other co-morbidities were excluded from the study. We recorded, demographic factors including age, gender, address, smoking, past medical history including previous or family history of cardiovascular disease and diabetes, blood pressure on admission and any serious complication in hospital, random blood sugar and urea levels, and medication used in and on hospital discharge.

Patients were interviewed on day 2 to 4 of AMI after they had passed through the critical stage of illness and had been stabilised. Patients were specifically asked to respond about their condition in the weeks before their acute myocardial infarction. To asses the level of anxiety and to record the number of events reported, two standard scales were used 'The Hospital Anxiety and Depression Scale'[13], and 'Holmes Rahe Social scale'[14]. Self rated 14 item Hospital Anxiety and Depression Scale (HADS), which scores the severity of the symptoms of anxiety (score 0–21) and depression (scored 0–21), was used to asses the anxiety in both the groups.[15,16] To measure stress according to the Holmes and Rahe Stress Scale, the number of 'Life Change Units' that apply to events in the past year of an individual's life are added and the final score will give a rough estimate of how stress affects health. According to the scale a Score of ≥300: At risk of illness; Score of 150–299: Risk of illness is moderate (reduced by 30% from the above risk); Score ≤150: Only have a slight risk of illness.[17]

For statistical analysis, patients for anxiety were divided into three groups as those with score 0–7 were normal, those with scores 8–17 borderline abnormal and those with score 18–21 abnormal and had anxiety. We then determined the cut-off for the HADS (total combined anxiety and depression score 17 or above), which provide the best sensitivity (87.7%) and specificity (84.7%) to diagnose depressive disorder.[18] The questionnaire of HADS and HRS was completed from the patients as to reflect their mood during the weeks before myocardial infarction. In order to avoid recording mood changes that occur as immediate reaction to the infarction and during time spent in coronary care unit, the questionnaire was completed on day 2 to 4 of admission after they have been stabilised.

Continuous variables were expressed as Mean±SD and independent sample *t*-test was used to analyse the mean difference between groups, whereas discrete variables were expressed as percentages and analysed by Chi-square test. A p value <0.05 was considered as statistically significant. Calculations were performed with statistical software package SPSS-15.

RESULTS

Two hundred consecutive patients of acute myocardial infarction and 200 healthy controls among relatives of patients were assessed on HADS and HRS scale for the presence of anxiety and psychosocial stressful life events. Sixty-three percent of the patients were males in both groups. Mean age of the patients with AMI was 59 years while that of control group was 52 years. Although significantly different statistically between the two groups, age had no significant effect on the presence of anxiety in any group (p<0.4).

For scores of anxiety on HADS, 34% of the controls had normal score compared to of the 19% AMI group (p<0.001), while 57% of the AMI patients had abnormal score compared to 39% of the control group (p<0.001), (Table-1). For level of anxiety and depression on HADS, 70% of the control group compared to 83% of the AMI group reported abnormal scores (p<0.001), (Table-2). The number of events reported on HRS scale in patients with AMI were significantly more (4.2±2) compared to the number of events (2.7±1.6) in the control group with (p<0.001). Scores for the number of events on HRS scale were significantly less 98±64 in controls compared to (158±5.8) in group with AMI (p<0.001), (Table-3).

When the intra group comparison was made in patients with AMI for female and male, 70% of the female patients reported significantly higher scores of anxiety on HADS compare to 50% in male patients (p<0.005), (Table-4). On the other hand, 12% of the females with AMI had normal score of anxiety on HADS compared to 23% of male patients (p<0.057). Significantly more females (93%) had abnormal level of anxiety and depression on HADS compared to male patients (77%) (p<0.003), (Table-5). Female patients had higher mean blood sugar (150±85 mg/dl) compared to 116±60 mg/dl in male patients (p<0.003), (Table-6).

All other parameters including age, blood pressure, pulse rate, diabetes, and location of myocardial infarction and use of medication had no significant association with the presence or absence of anxiety, number of events, or level of anxiety and depression in patient with AMI (Table-6).

Table-1: Score of anxiety on HADS in patients with AMI and control group

	Group		
	Controls	AMI patients	*p*
Normal	68 (34.0%)	38 (19.0%)	<0.001

Borderline Abnormal	53 (26.5%)	47 (23.5%)	0.488
Abnormal	79 (39.5%)	115 (57.5%)	<0.001
Total	200 (100%)	200 (100%)	

Table-2: Level of anxiety and depression on HADS in experimental and control groups

	Group		
	Controls	**AMI Patients**	***p***
Normal	25 (12.5%)	16 (7.5%)	0.138
Borderline Abnormal	35 (17.5%)	18 (9.0%)	*0.012*
Abnormal	140 (70.0%)	166 (83.0%)	*<0.001*
Total	200 (100%)	200 (100%)	

Table-3: Scores and number of events reported on HRS in controls and patients with AMI

		n	**Mean±SD**	**Mean Difference**	***p***
Scores on HRS	Controls	200	98.4±64.5	59.75	<0.001
	AMI Patients	200	158.1±5.8		
No. of Events Reported	Controls	200	2.7±1.65	1.5	<0.001
	AMI Patents	200	4.2±2.01		

Table-4: Score of anxiety on HADS in patients of AMI and control groups

	Male	**Female**	***p***
Normal	29 (23.0%)	9 (12.2%)	0.057
Borderline Abnormal	34 (27.0%)	13 (17.6%)	0.129
Abnormal	63 (50.0%)	52 (70.3%)	0.005
Total	126 (100%)	74 (100%)	

Table-5: Level of anxiety and depression on HADS in AMI patients

	Male	**Female**	***p***
Normal	13 (9.5%)	3 (4.1%)	0.117
Borderline Abnormal	16 (12.7%)	2 (2.7%)	0.016
Abnormal	97 (77.0%)	69 (93.2%)	0.003
Total	126 (100%)	74 (100%)	

Table-6: Other parameters between male and female patients of AMI

		n	**Mean±SD**	**Mean Difference**	***p***
Pulse	Females	74	80.89±19.92	0.098	0.973
	Males	126	80.79±18.59		
Systolic BP	Females	74	129.16±32.05	1.869	0.67
	Males	126	127.29±25.64		
Diastolic BP	Females	74	80.23±20.12	0.452	0.871
	Males	126	79.78±17.01		
Blood Urea	Females	74	40.39±19.58	1.709	0.541
	Males	126	38.68±18.14		
Blood Sugar	Females	74	150.23±85.50	34.09	***0.003***
	Males	126	116.13±60.11		

DISCUSSION

Our study identifies that majority of AMI patients had anxiety and stressful life events in the weeks preceding the AMI that might have causal association with the event. Assessment of patients for anxiety and depression on proper scales identifies more patients than formal assessment. Therefore, we applied HRS and HADS scales for recognising the level of anxiety and stressful life events that has also been recently used to diagnose in the weeks preceding Myocardial Infarction in patients with acute myocardial infarction.[16] Our findings are consistent with results of the study recently reported by Chockalingam A *et al*.[19]

It has been predicted with strong evidence that it is the poor social class of the developing countries to bear the brunt escalating epidemic of CAD in the near future.[20] Pakistanis are part of ethnic group that suffers highest prevalence rates of CAD compared to others throughout the world —CAD manifest at a younger age with a significant narrowing sex difference.[21,22] More of female patients in our study population suffered from anxiety and stressful events in their pre-AMI period than male patients. Psychosocial stress and anxiety adversely affects the lipid profile of women.[23] The number of females affected with CAD is increasing and it has been predicted that by 2050 females will surpass male and will make 54% of the CAD population.[20] The mean blood sugar level of female patients in our study was also much higher than male patients. Jaume Marrugat *et al*[24] also reported that women had more anterior location of AMI, more associated co-morbid conditions and higher immediate and 28 days mortality than men.

Stress and anxiety both are also more prevalent in the deprived and poor socioeconomic class, this lethal combination of CAD, psychosocial stresses, anxiety and poverty must be targeted in both primary and secondary preventive strategies in a developing country like Pakistan, female population needing special attention regarding prevention of CAD. The increasing incidences of terrorism, lawlessness, social injustice, alarming price hike and unavailability of daily commodities, particularly in our part of the country, might have made our people more prone to have low threshold for the development of anxiety and depression. Our rapidly modernising lifestyle is heaping an extra burden on the people and, at the same time, the numbers of job opportunities are shrinking, leading to a general rise in stresses and anxiety. The price hike and the diminished purchasing power of the citizens as reasons for the increase cases of depression and suicide.[25]

The INTERHEART study in a large number of participants of multiple populations and ethnic groups has shown that the effects of stress on acute myocardial infarction are similar in men and women, in people of various ages, and all geographic regions of the world.[26] If this effect is truly causal, the importance of psychosocial factors is much more important than commonly recognised, and might contribute to a substantial proportion of AMI.

Future prospective observational studies should consider carefully for the timing of onset of anxiety and whether any specific stresses are particularly cardiotoxic to identify subgroup that are most likely to benefit from intervention.

CONCLUSION

A significant proportion of patients report high level of anxiety and stressful life events in the preceding weeks of the acute ST segment elevation myocardial infarction. Both anxiety and stressful life events were more commonly reported in female than male patients.

STUDY LIMITATIONS

This study was limited by the fact that it was performed in a single medical setting and included only moderate number of patients, so the finding can not be generalised**.** Furthermore the patients were assessed only after the index event. It is possible that the patients' reporting of stress may have been influenced by the event. The subjective score is only a comparison with the individual's 'baseline' stress levels months or years earlier. The study did not include performance of objective assessment of stress. Nevertheless, this study underscores the significance of anxiety and subjective stress in precipitating acute coronary events. The patients of unstable angina were deliberately excluded to avoid overlap with non-specific chest pain syndromes. These non-specific symptoms may occur more often with high mental stress and would have confused the results.

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