

Acute Myocardial Infarction with Depression

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ABSTRACT

Background: The relationship between cardiac disease and depression is complex, there is some evidence that depression may actually lead to cardiovascular disease and vice versa.

Objective: To clarify the effect of depression on patients with A.M.I

Methods: A prospective study carried out in Ibn-Senna teaching hospital of Mosul. Department of coronary care unit from November 2003 to June 2004. Two hundred patients with acute myocardial infarction were included in this study, one hundred three had depressions and 97 had no depression. The age, sex, marital status, the educational status, physical activity, Diabetes mellitus, hypertension, smoking, hypercholesterolemia for all patients. Were taken in consideration.

Results: Depression was prevalent among patients with AMI, a higher percent for females group 57% Vs 43 % of Males. P. Value <0.05 and odds ratio. 2.85. The mean age of depressed group for female was 55.86 \pm 9.25 and for non-depressed group for females was 50.41 \pm 10.60 and the p. value was 0.005. For males, the mean age group with no depression was 55.97 \pm 10 and depressed male group 58.03 \pm 11.22 and p.value 0.393 N.S. Also, higher percent of depression was among those with low educational status 80%. Vs 34 % who had no depression. P-value < 0.05 and OR :7.57. In depressed group, a 29% of them developed symptoms of Ischemia with depressive symptoms Vs. 14 % of non-depressed group p-value 0.021 and Odds ratio: 2.25.

Conclusion: Depression was higher among females patient Also, a higher percent of depressed patients had low educational status and recurrent Ischemia.

Keywords: Acute myocardial infarction (AMI), Odds ratio (OR).

INTRODUCTION

AMI is a serious disease that affect many people in acute onset during which patients react in abnormal way and some had depressed mood. Over the past decade, evidence has accumulated to suggest that depression may be a risk factor for cardiac mortality in patients with established coronary artery disease ^(1,2,3,4).

Most studies have documented a marked association between depression and cardiac outcome in patients with different clinical presentation of coronary artery disease ^(4,5,6,7). other studies have examined prediction of particular aspects of outcome. There is also limited evidence that initial distress after AMI predicts outcome for return to work ^(8,9) compliance with medical treatment ^(10,11,12) and subsequent chest pain. It is commonly thought that traditional risk factor namely hypertension, high cholesterol, cigarette smoking and physical inactivity can at best explain only 50% of the variation in mortality in coronary heart disease ⁽¹³⁾. Attention has shifted to mood states such as depression and anxiety as an additional risk factors ^(3,4,14). Other suggested explanation of the relationship between depression and heart disease include cigarette smoking and comorbid psychiatric disorders.

Life stress and social isolation were both independently associated with higher mortality risk after AMI in one study, with patients high in both stress and isolation manifesting the highest mortality risk. ^(4,15,16)

Early prediction of psychological problems is an important clinical issue because it is believed that there is considerable "potential for large cost saving" through improved treatment of depression in the physically ill.

The higher prevalence of depression in women coupled with these studies suggesting that women may have worse post MI prognosis than men's ⁽¹⁷⁾ has led to the speculation that gender differences in depression may be responsible for some of the difference in prognosis ^(18,19).

Although exactly how mood disturbances adversely affect post MI outcome is unknown, the risk of depression reported in many recent study had led to speculation about possible mechanisms linking depression and increased cardiac risk as shown in the (Table1)⁽⁴⁾.

Table (1) Possible mechanism linking depression after myocardial infarction (AMI) and increased mortality ⁽⁴⁾.

Possible Mechanisim	Specific abnormal finding
Life style and behaviour	Decreased adherence to risk reducing recommendations.
Neurocardiogenic	Increased susceptibility to ventricular arrhythmia decreased heart rate variability.
Platelet function	Increased platelet activation.
Treatment	Decreased use of cardiovascular procedures.

AIM OF THE STUDY; 1To see the association ofdepressive disorder among AMI patients after hospital admission.2To clarify the effect of depression on morbidity and mortality of patients with AMI.3To planning after care and rehabilitation.

Methods

A prospective study conducted on two-hundred patients with Acute Myocardial infarction 110 male and 90 female with age of 25 years up to 75 years who met established criteria for AMI, were recruited from coronary care unit at Ibn-Senna teaching hospital of Mosul, between November 2003 and June 2004.

Patients had to meet at least two of the following criteria for diagnosing acute myocardial infarction ⁽²⁰⁾.

- 1) Typical ischemic chest pain lasting at least 30 minutes.
- 2) Evolution of electrocardiogram (ECG) changes. AMI can be divided into two groups on the basis of their associated ECG finding:
 - a.ST segment elevation AMI.
 - b. Non-ST segment elevation AMI.^(3,17)
- 3) A peak creatinine phosphokinase (CK) level greater than 1.5 times the normal limit, or a CK-MB (the myocardial iso enzyme of (CK) value 225 IU/L or 5% of a simultaneous CK value exceeding the upper normal limit.

Troponine are now considered the criterion standard in defining and diagnosing AMI but unfortunately not available in our hospital Patients were interviewed as soon as they were medically stable, on average 3-5 days after their AMI and applied the questionnaires of DSM IV (Diagnostic and statistical manual of mental disorder 4th ed.), which consist of the following items⁽¹⁸⁾.

- a- Presence of five or more of the following symptoms most of the day, nearly every day, through at least a 2-weeks period, after excluding medical conditions or drugs as a cause, with at least depressed mood or loss of interest being present.
 1. Depressed mood indicated by subject report (feel sad) or obstruction made by others.
 2. Marked loss of interest or pleasure in all activities indicated by subjects account or observation by others.
 3. Disturbance of appetite or significant weight loss.
 4. Sleep disturbance or insomnia.
 5. Psychomotor retardation or agitation.
 6. Fatigue or loss of energy.
 7. Feeling of worthless or inappropriate guilt/low self esteem.
 8. Decreased ability to think, concentrate or make simple decisions.
 9. Recurrent thoughts of death with suicidal ideation at times.
- b- Symptoms cause clinically significant distress or impairment in social, occupational, or other important functions.
- c- Symptoms are not better accounted for by bereavement of close relatives and tend to persist for longer than two months after stressful events with marked functional impairment and morbid preoccupation.

Moreover,demographic data including age, gender educational status, socio economic status, physical activity, stressful events and marital statuswere reported for all patients in addition toinformation about the disease state of participant like diabetes mellitus, hypertension current smoking, hyper cholestrolemia.

Regarding the acute myocardial infarction state whether, ST-segment elevation or non ST-segment elevation, mean peak creatinine kinase and echocardiographic result of left ventricular ejection fraction for all patients were documented.

Furthermore, all patients asked about taken drugs like B-Blocker, or thrombolytic therapy also we add the time of staying in coronary care unit in days

We follow those patients while staying in CCU and on discharging from hospital, we take chart to every patient that include all information mentioned above regarding the AMI-states and presence or absence of depression and what care that given to them and what complication that develop during hospitalization and drugs that discharge on.

After determine the depressed patient at baseline interview, and during follow up, we compared summary statistics for all demographic and clinical variables for patients who were depressed with those who were not depressed.

Aspects of care and clinical outcomes were also compared for patients who were depressed with those who not depressed. The aspects of care compared those with invasive cardiac procedure, the proportions of patients taking cardiac and psychotropic medication. The outcomes compared were the cumulative incidence of cardiac complication during the initial admission to hospital.

RESULTS

Patients in the present study with AMI were 200, those with depression were 103, and those without depression were 97. Female patients who had depression were found to be 59, while male patients with depression found to be 44..and higher among the age between 50-69 years for both sex. (Table 3).

Acute myocardial infarction with depression was present in higher percent (%) among females 59 (57%), while patients with low-educational status, 82(80%) of them had depression in association with acute Myocardial infarction.

61 (59%) patients with poor-socio-economic status
48 (46%) patients with poor physical activity.
54(52%) patients with history of major stressful events. Table

(4). Cardiac catheterization were indicated for 40 (38%) patients with AMI and depression Vs 24(23%) patients without depression.

Other medication that given to patients like (Aspirin, ACE-inhibitor calcium channel blocker and psychotropic medication) show slight difference between Acute MI with and without depression, while B- Blocker, lipid lowering drug, nitrate, show significant difference as showing in (Table5).

(Table 6) Recurrent Ischemia was present in 30(29%) patients of AMI with depression Vs 15(14%) patients without depression.

Congestive heart failure was present in 28 (27%) patients of AMI with depression Vs 15 (14%) without depression.

Readmission because of angina was present in 27(26%) patients of AMI with depression Vs 14 (14%) without depression.

Arrhythmia as a leading cause to death was present in 6(6%) of AMI depressed patients while only 3(3%) of non-depressed group had arrhythmia as a cause of death. (Table 5).

Table 2: shows distribution of Acute MI according to the age and sex.

Sex \ Age	Female No. = 90	Male No. = 110
< 29	0	1
30-39	4	7
40-49	18	30
50-59	28	33
60-69	23	30
70-75	17	9
Total	90	110

Table (3) shows the distribution of AMI with depression among the age and sex.

Sex	Female		Male		P-value	OR
Age	No. = 59	%	No. = 44	%		
< 29	0	0	0	0	-	0.00
30-39	4	4	0	0	< 0.05	-
40-49	9	15	7	15	N.S	3.30
50-59	23	39	18	40	N.S	3.83
60-69	15	25	14	31	N.S	2.14
70-75	8	13	5	11	N.S	0.71
Total	59	57	44	43	N.S	2.86

Table 4: Shows the difference between depressant and non-depressed group in characteristic of studied patients with AMI

Characteristic	Depression		Non-depressed		P-value	OR
	No. 103	%	No. 97	%		
Female sex	59	57	31	32	0.000	2.85
Low educate	82	80	33	34	0.000	7.57
Poor S.E.St.	61	59	23	24	0.000	4.67
Poor Physical activity	48	46	10	10	0.000	7.59
Major stressful events	54	52	9	9	0.000	10.78
Marital status (Married)	103	100	97	100	N.S	-
DM	47	45	32	33	N.S	1.71
HT	54	52	53	55	N.S	0.92
Current smoking	69	67	67	71	N.S	1.91
Hypercholestaemia	50	48	43	44	N.S	1.18
ST-Segment elevation	90	87	95	98	0.005	0.15
Echo for low LVEF	39	38	20	21	0.008	2.35
Thrombolytic therapy	98	95	89	92	N.S	1.76
Mean age	Female	55.86± 9.25		50.40±10.60	0.05	
	Male	58.03± 11.22		55.97±10	0.393 (NS)	
Peak CPK	420± 256		437± 335		0.674	

Table 5: shows the aspect of care for patients with and without depression after AMI

Aspect of care		Depression		Non-Dep.		P- Value	OR
Invasion cardiac procedure		103		97			
	A-cardiac cath	40	38%	24	24.7%	0.033	1.93
	B- PTCA	0	0	0	0	N.S	-
*Cardiac medication							
	Aspirin	97	94	94	96.9%	0.352	0.52
	B-Blocker	67	65	47	48.4	0.018	1.98
	ACE inhibitor	57	55	45	46.3	N.S	1.43
	Lipid lowering drug	92	89	73	75.2	0.009	2.75
	Nitrate	92	89	96	98.9	0.004	0.09
	Ca-channel blocker	24	23	19	19.5	N.S.	1.25
*Psychotropic medication							
Antidepressant		3	3	0	0	N.S	-
Anxiolytic		48	46	32	32.9	0.050	1.77

Table (6): Shows the incidence of cardiac complication and death among patients without and with depression after AMI.

Cardiac Complication		Depression		Non- Dep.		P-value	OR
		No. 103	%	No. 97	%		
I	- Recurrent Ischemia	30	29	15	15.4	0.021	2.25
	- Congestive H.F	28	27	15	15.4	0.044	2.04
	- Arrhythmia	36	34	25	25.7	N.S	1.55
	- PVC	43	41	39	40.2	N.S	1.07
	- Recurrent MI	5	5	4	4.1	N.S	1.19
II – Re- admission because of :							
	- Angina	27	26	14	14.4	0.039	2.11
	- Recurrent MI	5	4	2	2.06	N.S	2.42
	- CHF	16	15	10	10.3	N.S	1.60
	- Arrhythmia	11	11	6	6.1	N.S	1.81
III- Death		8	7	6	6.1	N.S	1.28
* Arrhythmia		6	6	3	3.09	N.S	1.94

PVC = Premature ventricular contraction

DISCUSSION

The present study shows that depression was common among patients with AMI, with higher percent of patients who had depression in female group 57% vs 43% in males, and those patients who were depressed more likely to be above the age of 50 years for both female and male. This can be explained by the fact that patients with a disease state, growing older, the death of friends among their age group and the physical limitation and how to react with these problems, all these lead to disturbances of mood in the form of depression which are frequently undiagnosed and untreated in these patients^(19,20).

Those patients with low educational status and acute myocardial infarction higher percent of them had a depression 80% Vs 34% without depression. P-value: 0.000 OR: 7.57. In addition, patients with low-socio economic status 59% of them had AMI with depression in comparison with 24% of the same group without depression OR 4.67.

Patients with poor physical activity who develop AMI higher percent of them had a depression 46% Vs 10% in non-depressed group. OR=7.59 the P. value < 0.05. These findings were prevalent among female group "studies of various cultures have shown that the depression disorder is approximately twice as prevalent in women as in men, regardless of age⁽²¹⁾.

Negative life events can precipitate and contribute to depression among those with sever marital or relationship problem⁽²²⁾.

Patients who were unmarried, who lived alone, or who reported No close relatives or little contact with close friends and relatives experienced more symptoms of depression 1-year after acute myocardial infarction⁽⁴⁾.

Furthermore, this study shows that depression was more in patients with low LVEF 38% vs 21% p-value: ≤ 0.05 and OR 2.35.

These might explain the severity of the disease state and the limitation in patient activities and how to cooperate with the work⁽²³⁾.

In this study, there were significant proportions of AMI patients give a history of major stressful events before admission to hospital 52% of those with major stressful events had depression while only 9% of them not depressed P-value < 0.05 and OR 10.78.

These stressful events lead to two types of reactions;

- 1- Active defense reaction
- 2- Passive depressed type.

In these reactions a combination of behavioral and neuroendocrine changes take place.

CONCLUSION

The high prevalence and persistence of symptoms of anxiety and depression over the first six months after AMI⁽²⁴⁾ Provides a sufficiently strong point that needs more attention to direct to the emotional status of recovering AMI patients and cardiology is beginning to embrace other outcomes, such as quality of life⁽²⁴⁾. Research has shown that depression and anxiety measured at the time of AMI are the predictive of quality of life twelve months later^(12,15). It is for these reasons the authors have confirmed recently that treating symptoms of anxiety and depression in AMI patients is an important thing and it will remain so even if there is no causal link between such symptoms and subsequent cardiac events and mortality.

Recommendation

From this study, we recommend a pharmacological and/or cognitive behavioral therapy treatment for depression which plays an important role in reducing the adverse impact of depression. Also, we add exercise as another potential pathway to reduce both depression and risk of hard disease^(23,24). Selective serotonin re-uptake inhibitor (SSRIs) are the first line agents in the treatment of mild to moderate depression unlike their tricyclic antidepressant (TCA). SSRIs have repeatedly been demonstrated to be safe and to have a negligible effect on the cardiovascular system, even in cases of over dose⁽²⁴⁾.

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