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A STUDY OF MORTALITY AND COMPLICATION RATE OF DIABETICS WITH MYOCARDIAL INFARCTION

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ABSTRACT:

Diabetes Mellitus is a common endocrine disorder. Ii increases and accelerates atherogenesis. Cardiovascular complications dominate the lives of diabetic patients, with most succumbing to coronary artery disease. We studied the mortality and major complication rate of diabetics who developed an acute myocardial infarction. 26.4% of patients died during the index infarction and overall about 79% had at least one significant myocardial infarction related complication. Diabetic patients with a myocardial infarction need to be treated as a special group with close monitoring of their blood sugar levels to reduce the incidence of mortality and complications. Efforts should be made to prevent diabetes mellitus by the avoidance or treatment of obesity and by encouraging physical activity.

INTRODUCTION:

Diabetes Mellitus (DM) is a clinical syndrome characterised by hyperglycemia due to a relative deficiency of Insulin or increased resistance to its effects. The prevalence of DM in Pakistan is about 2-6% with many amongst the population remaining undetected.

Atherosclerosis and arterio sclerosis occurs more commonly and more extensively in patients with DM. DM is a known risk factor for the development of coronary artery disease (CAD). The Framingham study has shown an increased incidence of angina pectoris, myocardial infarction and sudden death in diabetics, particularly females. Most studies with coronary angiography show a higher frequency of triple vessel disease in diabetic patients.[1]

The purpose of our study was to look at the mortality and complication rale of patients with diabetes mellitus who experience a myocardial infarction.

PATIENTS AND METHODS:

The study was carried out in the cardiac care unit of civil teaching hospital, Abbottabad. Patients with Acute myocardial infarction and DM were included in the study. Acute myocardial infarction was diagnosed when at least two of the following three criteria were fulfilled:

1. History of chest pain lasting for at least 20 minutes.

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2. Progressive or evolving changes on serial 12 lead electrocardiograms.
3. Elevation of cardiac enzymes (CPK, LDH & SCOT) consistent with a myocardial infarction.

A patient was considered to have DM if he/she had any of the following:

(a) Was a known diabetic on regular treatment?
(b) A random blood sugar more than 200 mg/dl.
(c) A fasting blood sugar more than 130 mg/dl on more than one occasion.

Blood glucose was measured by enzymatic (Glucoseoxidase) method. Complications regarded as being primarily due to acute myocardial infarction were considered. All the major electrical, mechanical vascular and ischemic complications of Acute Myocardial Infarction (AMI) were carefully documented in these patients. Asymptomatic complications or complications not requiring specific intervention were not included. Specifically included were fatal MI, pulmonary edema due to LV7 unstable angina pectoris, recurrent MI, symptomatic pericarditis, stroke, mitral regurgitation, atrial fibrillation, conduction defects requiring cardioversion or cardiac pacing. Efforts were made to support the clinical diagnosis by radiological and echocardiographic methods where possible.

RESULTS:

Over 18-month period 34 patients with known or newly diagnosed diabetes were found to have had a definite AMI. 22 of these were males and 12 females. The age range 2as 38-81 years with a mean age of 55.1 years.

Anterior MI was diagnosed in 26 patients (76%) Anterior myocardial infarction was present in 75% of females and 63%; of male patients. The overall mortality rale 2as 26.4% with a male: female ratio of 22.4% vs 33.3%. The great majority of deaths were due to cardiogenic shock secondary to extensive anterior MI.

Nine patients (26%) had an episode of LV7 5 patients had unstable angina 1 patient suffered a stroke secondary to suspected cerebral embolism. I patient had uncontrolled Atrial fibrillation. There were no eases of symptomatic mitral regurgitation. One patient had fatal recurrent MI. 2 patients required cardiac pacing but died subsequently. 1 patient had pericarditis. Overall 79% of patients had at least one major complication of AMI. The mortality and complication rale of female patients was significantly higher. If, minor complications or asymptomatic complications were to be taken into account it would not be surprising to find almost every diabetic patient developing an AMI related complication.

DISCUSSION:

Diabetic patients arc prone at an early age than the general population to develop

cardiovascular diseases and complications secondary to it. The prevalence of CAD is increased among diabetic patient's CAD is the most frequent cause of death in diabetic patients. The incidence of CAD correlates more closely with the duration rather than the severity of diabetic. The risk of CAD is particularly high in women. Studies show that mortality rates for CAD arc 2-3 times higher

among diabetic men but 3-7 limes higher amongst diabetic women than among non-diabetic individuals.[2]

The occurrence of AMI has a distinctly adverse effect on carbohydrate and lipid metabolism. Hyperglycemia and reduction in glucose tolerance appear to be due to increased catecholamine concentrations, increased circulating free fatty acid levels, adipose tissue lipolysis hepatic and muscle glycogenolysis, suppression of insulin release and increased circulating concentrations of cortisol and growth hormone.[1'] The net result is carbohydrate intolerance which is exacerbated in patients with diabetes mellitus.

The association between DM and cardiac disease is complex. Hypertension, hyperc-holesterolemia and hypertriglyceridemia arc all more common in diabetic. The frequency of AMI is increased in diabetic patients. Also the treatment during AMI is more complicated. Patients with poorly controlled DM exhibit a significantly increased mortality with a AMI.[5]

Several factors contribute to the increased mortality of diabetic patients with AMI. The size of the infarct tends to be bigger in diabetic than in non-diabetic patients[6], also patients tend to have a higher frequency of congestive cardiac failure and cardiogenic shock.[7] The increased mortality of diabetics with AMI is not necessarily due to large infarctions, it tends lo correlate more with increasing severity of diabetes mellitus.[8],[9].

Survival after AMI is also more limited than in non-diabetic patients, with fatality rate as high as 25% in the first year alter the index infarction.[10] Recurrent infections, heart failure and dysrhythmias all contribute to this higher death rate." There is evidence of a beneficial effect on mortality of tight metabolic control with insulin infusion during the immediate post MI period.[12]

Analysis of date of myocardial infraction from this CCU reveals that at least 6% of patients admitted with AMI have known or newly diagnosed DM. The overall mortality of AMI is 15.5% which includes diabetic patients. Thus it would appear that diabetics have about twice the in-hospital mortality of AMI as compared to non-diabetics. This indeed is quite alarming and calls for treating patients with DM with extra care and attention before they develop over CAD and also when they develop an acute MI.

Reduction of CAD risk in individual diabetic patients depends on control of obesity correction of hypertension, improvement in cholesterol levels, elimination of cigarette smoking and encouraging physical activity.[13] Prevention of DM by the avoidance or treatment of obesity is of paramount importance. There is evidence from studies that increased physical activity can reduce the incidence of diabetes mellitus.[14] The abase diabetic should particularly try to lose weight as this is usually accompanied by better control of hyperglycemia, hypertension and hyperlipidemia. The diabetic patient should be encouraged ıo attend follow-up clinics, to use medications regularly and to have random blood sugars intermittently in order to achieve good metabolic control.

A Non diabetic control group with myocardial infarction for comparison was not included in the study as the patients with diabetes mellitus were recruited over 18-month period. A similar number of age and sex matched nondiabetic patients with AMI could have been included on a random basis. This however could have had an element of biasing ease selection. Overall mortality

data for AMI from our unit is available for purposes of comparison and arc presented.

Our study clearly shows that diabetics who have an AMI have a markedly increased mortality rale and a large majority develop non-fatal complications. Patients with DM who have an AMI need to be treated as a special group with great care and attention. Efforts should be made to achieve goal glycemic control during the post infarction period.

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