Original Research Paper

Cardiology

A STUDY OF CORELATION OF HOMOCYSTEINE LEVELS IN YOUNG PATIENTS WITH ACUTE MYOCARDIAL INFARCTION IN A TERTIARY CARE CENTRE

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ABSTRACT **INTRODUCTION:** Hyperhomocysteinaemia is implicated as a risk factor for several diseases. Homocysteine is influenced by several factors and plasma levels are determined by a combination of acquired and lifestyle factors. Treatment to reduce Homocysteine levels is inexpensive and safe; however, there is still some debate as to whether raised Homocysteine is a cause or effect of disease. Therefore, we decided to study the role of Homocysteine in patients diagnosed with Acute Myocardial Infarction in young and to correlate with other known risk factors.

MATERIAL AND METHODS: This study was conducted as a cross sectional study, wherein written informed consent will be taken prior to the investigation after detailed information given to the participant's patient party regarding the study on patients aged less than 40 admitted in A. J. Hospital and diagnosed with Acute MI who met a predefined inclusion and exclusion criteria initiated after obtaining clearance from the institutions ethical committee. Homocysteine level estimation done by Fluorescence Polarising Immunoassay. The data was collected in pre-prepared proforma and then transferred to a master chart for analysis. The collected data was analyzed using student's T test and Chi-Square Test. Statistical Analysis was done using SPSS software version 23.0. A 'p' value less than 0.05 (p<0.05) is considered significant.

RESULTS: In the study conducted on 60 patients aged less than 40, admitted in A. J. Hospital we found that males were affected more than females in our study. Among the cases (patients with MI) the mean Homocysteine was found to be significantly higher compared to the aged matched controls (patients without MI). After application of statistical analysis using students T test it was observed that there was very high significant difference in homocysteine level among 2 groups (p<0.001).

CONCLUSIONS: In our study, we intended to study the significance of Homocysteine as a risk factor in patients aged less than 40 diagnosed with Myocardial Infarction. We conclude that elevated Homocysteine levels plays a major role as a risk factor for MI. We recommend that it is efficacious to check Homocysteine levels in patients having strong family history and to treat the same.

KEYWORDS : myocardial infarction, homocysteine, Hyperhomocysteinaemia

INTRODUCTION

During the past 20 years, the battle to reduce the incidence of cardiovascular disease has lad researchers to the discovery of various clinical markers. There are some cases with myocardial infarction those who do not have any of the traditional risk factors. Therefore, attention has been focused on other predisposing factors, which may contribute to myocardial infarction. Researchers have taken effort to find the possible association between plasma homocysteine levels and acute myocardial infarction (MI).

Homocysteine is a nonessential, Sulphur containing amino acid and it is an intermediate from the metabolic demethylation of dietary methionine. It is present in plasma in four forms: a free thiol (1%); disulfide (5-10%); mixed disulfide (5-10%) and protein bound thiol groups (80-90%). The combined pool of all four forms of homocysteine is referred as total plasma homocysteine (1).

The total homocysteine levels in plasma has been reported to be in the range of 5-14mM/l_ in healthy individuals. (2)

Altered homocysteine metabolism play a potential role in the pathogenesis of atherosclerosis, thromboembolism and vascular endothelial damage. Individuals untreated for hyperhomocysteinemia may have major cardiovascular events before the age of 30 years. (3)

Several studies conducted in different parts of the world have reported that elevated levels of plasma homocysteine are associated with coronary artery disease, independent of other risk factors (4, 5).

As the concentrations of homocysteine is also influenced by genetic background there is need to study on homocysteine levels in different ethnic groups. Studies are inadequate among Indian population to establish the role of homocysteine as an independent risk factor for acute myocardial infarction. Therefore, this study has been undertaken among South Indians in whom the incidence of mortality due to myocardial infarction is high.

AIMS OF THE STUDY

The aim of the study was to study and correlate the plasma Homocysteine levels in patients of Acute Myocardial Infarction less than 40 years of age.

To establish the importance of measuring plasma Homocysteine levels in all young patients with Acute Myocardial Infarction.

MATERIAL AND METHODS

This study was conducted as a Case - Control study, wherein written informed consent will be taken prior to the investigation after detailed information given to the participants /patient party regarding the study on 60 patients aged 40 or less than 40 years admitted in A. J. Hospital and diagnosed to have Acute Myocardial Infarction, who met a predefined inclusion and exclusion criteria. The study was initiated after obtaining clearance from the institutions ethical committee.

The criteria were as follows
Inclusion criteria:
1. Patients aged 40 years or less.
2. Patient fulfilling WHO criteria for Acute MI, which requires at least two of three elements

a) History of Ischemic chest discomfort.
b) Serial ECG changes.
c) Elevated Cardiac Enzymes.

EXCLUSION CRITERIA:
1. Patients aged > 40 years.

Following selection, the following was done
- History, (including family history)
- A complete clinical examination
- CBC, ESR

- Renal function test, Liver function test, Serum Electrolytes
- Urine Routine,
- BT, CT, PT/INR. aPTT
- ECG
- Chest X- ray (PA view).
- USG Abdomen
- Fasting Lipid Profile,
- Serum Homocysteine Level

The data was collected in pre-prepared proforma and then transferred to a master chart for analysis

DATA AND STATISTICAL ANALYSIS
The collected data was analyzed using mean, mode for demographic data and frequency percentage for the analysis of the clinical data.

Statistical Analysis was done using SPSS software version 23.0.
A 'p' value less than 0.05($p<0.05$) is considered significant.

The various measures of central tendencies and graphical representations were used to analyze the data.

RESULTS AND OBSERVATIONS
In the study titled **"A STUDY OF CORELATION OF HOMOCYSTEINE LEVELS IN YOUNG PATIENTS WITH ACUTE MYOCARDIAL INFARCTION IN A TERITIARY CARE CENTRE"** conducted on 60 patients aged 40 years or less admitted in A. J. Hospital these were our observations:

Age distribution:

	N	Minimum	Maximum	Mean	Std. Deviation
Age	60	23	40	32.45	7.520
Valid N	60				

Age and Gender wise distribution of the study participants				
		sex		Total
Age(in years)		Males	Females	
21-30	Count	9	7	16
	% of Total	11.7%	10.0%	21.7%
31-40	Count	34	10	44
	% of Total	56.7%	16.7%	73.3%
Total	Count	43	17	60
	% of Total	71.7%	28.3%	100.0%