ISCHEMIC HEART DISEASES;
HOMOCYSTEINE LEVEL IN PATIENTS

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ABSTRACT… Objectives: To determine the frequency of hyperhomocysteinemia level in patients with ischemic heart diseases. **Study Design:** Case series study. **Setting:** Liaquat University Hospital Hyderabad. **Period:** Six months. **Patients and Methods:** All the patients with known ischemic heart disease of either sex gave the history of myocardial infarction and echocardiography showed motion wall abnormalities were recruited and entered in the study. After confirmation of IHD, the 2cc venous blood sample was taken in sterilize disposable syringe and sent to laboratory for evaluation of serum homocysteine levels while the data was collected on pre-designed proforma and the data was analyzed in SPSS 16 and the frequency and percentage was calculated. **Results:** Total one hundred patients with known ischemic cardiac disease were recruited and evaluated for homocysteine level. The mean ±SD for age of patients with ischemic heart diseases was 55.82±10.94. Majority of the patients were males 57% and the male to female cross tabulation was statistically significant (p=0.02). The hyperhomocysteinemia was not statistically significant in relation to age while it is significant in relation to gender (p=0.01). The overall frequency of hyperhomocysteinemia in IHD was 62% with male predominance 66%, of sixty percent hyperhomocysteinemic individuals 41.9% had severe, 37.1% had intermediate and 21% had mild elevated homocysteine level (p=0.02). **Conclusion:** It was concluded that hyperhomocysteinemia was associated with ischemic heart disease (62%) with advance age and male gender predominance (66%).

Key words: Hyperhomocysteinemia, Homocysteine, Homocysteinemia and ischemic heart diseases.

INTRODUCTION

In n Pakistan deaths attributed to CVD is increasing with the expanding population and will continue to increase.[1] The literature in the past had shown that high rates of ischemic heart diseases in Pakistan are accompanied by conventional risk factors such as hypertension, diabetes, smoking, dyslipidaemia and sedentary life style.[2,3] Although it has been identified that as many as 30-50% of patients with CVD lacks the traditional risk factors and creates needs to evaluate for additional new risk factors that may predispose and leads the individuals to coronary vascular diseases.[4,5] The former literature in the past have been detected potential new risk factors for atherothrombotic vascular disease, the growing list of those risk factors includes raised blood levels of homocysteine.[6,7] The hyperhomocysteinemia leads to endothelial injury and causes inflammatory reaction in the vascular system and results in atherogenesis which is responsible for ischemic injury.[8] Hyperhomocysteinemia is a suspicious risk factor for coronary vascular diseases and the disease is presented when an atherosclerotic plaque interrupts blood circulation to the coronary vascular system.[9] The clinical studies indicate that elevated level of homocysteine is associated with coronary vascular diseases and cerebrovascular accidents.

Therefore this study was conducted to evaluate the homocysteine level in patients with ischemic heart diseases, as early diagnosis and effective

measure to stabilize homocysteine can save the patient to acquire various life threatening complications due to ischemic heart diseases.

PATIENTS AND METHODS

The cross sectional case series study of six months was conducted at Liaquat University Hospital Hyderabad. All the patients with known ischemic heart disease of either sex gave the history of myocardial infarction and echocardiography showed motion wall abnormalities were recruited and entered in the study. The exclusion criteria of the study were patients on hemodialysis, renal transplants and the patients already on folic acid, vitamin B12 or vitamin B6 therapy and immunosuppressive therapy.

The detail history, clinical examination was done, routine and specific investigations were advised for every specific subject while the informed consent was taken from every relevant subject for participation in the study. After confirmation of ischemic heart disease, the 2cc venous blood sample was taken in sterilize disposable syringe and sent to laboratory for evaluation of serum homocysteine levels while the data was collected on pre-designed proforma. All the clinical and ethical maneuvers including financial compensation were bear by the collaboration of whole research team. The serum homocysteine level was categorized as moderate 15 to 30µmol/L, intermediate 30-100µmol/L and severe ≥100 µmol/L.

The data was analyzed in SPSS version 16. The frequency and percentage (%) was calculated for homocysteine in ischemic heart disease in relation to age and gender. The mean ± SD was calculated for numerical variables. The stratification was done for age and gender while the chi-square test and independent sample t-test was applied at 95% confidence interval on categorical and numerical variables and the statistical significance was considered on p-value ≤0.05.

RESULTS

Total one hundred patients with known ischemic cardiac disease were recruited and evaluated for homocysteine level. The mean ±SD for age of patients with ischemic heart diseases was 55.82±10.94 while the age in relation to gender and serum homocysteine is shown in Table-I and II while the gender in context to homocysteine is mentioned in Table-III. The severity of homocysteine is presented in Table-IV while the mean ± SD of hyperhomocysteinemia in context to gender is mentioned in Table-V.

		GENDER		Total	P-value
		Male	Female		
AGE	40-49	6	7	13	
		10.5%	16.3%	13.0%	
	50-59	25	9	34	
		43.9%	20.9%	34.0%	
	60-69	13	20	33	0.02*
		22.8%	46.5%	33.0%	
	70+	13	7	20	
		22.8%	16.3%	20.0%	
Total		57	43	100	
		100.0%	100.0%	100.0%	

Table-I. The Age Distribution In Relation To Gender
Pearson chi-square = 9.11; df =03, statistically significant

		Homocysteine		Total	P-value
		Raised	Normal		
AGE	40-49	8	5	13	
		12.9%	13.2%	13.0%	
	50-59	20	14	34	
		32.3%	36.8%	34.0%	
	60-69	21	12	33	
		33.9%	31.6%	33.0%	
	70+	13	7	20	0.96*
		21.0%	18.4%	20.0%	
Total		62	38	100	
		100.0%	100.0%	100.0%	

Table-II. The Age Distribution in Relation To Homocysteine Level
Pearson chi-square = 0.26;
df =03, statistically non-significant

		Homocysteine		Total	P-value
		Raised	Normal		
GENDER	Male	41	16	57	
		66.1%	42.1%	57.0%	
	Female	21	22	43	0.01*
		33.9%	57.9%	43.0%	
Total		62	38	100	
		100.0%	100.0%	100.0%	

Table-III. The Gender Distribution in Relation To Homocysteine Level
*Pearson chi-square = 5.54;
df =01, statistically significant*

Hyperho-mocysteinemia	Gender		Total	P-value
	Male	Female		
Moderate	8	5	13	
	19.5%	23.8%	21.0%	
Intermediate	11	12	23	
	26.8%	57.1%	37.1%	0.02*
Severe	22	4	26	
	53.7%	19.0%	41.9%	
Total	41	21	62	
	100.0%	100.0%	100.0%	

Table-IV. The Severity of Hyperhomocysteinemia in Relation to Gender
*Pearson chi-square = 7.52;
df =02, statistically significant*

Gender	n = 62	Hyperhomocysteinemia	P-value
Male	41 (65%)	107.90 ± 47.01	
Female	21 (35%)	80.70 ±31.76	0.02*

Table-V. The Mean ±Sd For Serum Homocysteine In Relation To Gender
Statistically significant

DISCUSSION

It was reported that population from Pakistan had a higher probability of ischemic heart diseases. The lack of epidemiological data in our population in relation to homocysteine prompted us to conduct this study in context to association with IHD. In present study, the male population was predominant and more commonly encountered in the fifth and sixth decade that is consistent with former studies.[10-12]

In current series study, the youngest patients were 40 year old, of which seven were females and all were in the reproductive age group. Although it was mentioned that female gender has hormonal protection during such age group from ischemic cardiac disease but the present study observed 07 females with loss of such hormonal saving. Among these subjects two had stroke with existence of 2-3 conventional risk factors. Five of them had raised level of homocysteine while two patients with IHD had normal levels of homocysteine. Though not evaluated thoroughly, these subjects might have developed IHD due to other unidentified factors including coronary vascular anomalies. Hence it was observed that raised homocysteine levels could be a risk factor for IHD in younger population.

The findings are consistent with the studies by Wierzbicki A and Dankner R, et al.[13,14] The risk factors of IHD were categorized into four groups of which category three contain the homocysteine level.[15] The hypertension is the common risk factor for IHD and former literature shown that hypertension associated with increase in the homocysteine levels while in present study the majority of the subjects had hypertension history.

The diabetic population was also reported to have raised homocysteine levels and Cannon et al,[16] conducted a study and found the incidence of diabetes in IHD to be 32 to 67% and the present study 27% population had history of diabetes mellitus type 2.

In present series, most of the patients had sedentary life style. However, 05% of the subjects had active lifestyle but yet found to have IHD with hyperhomocysteinemia, so they might have other conventional risk factors. Smoking, dietary habits, coffee, alcohol and beer are main lifestyle components of tHcy. Modification in these parameters may decrease tHcy concentrations and leads to reduce cardiovascular and cerebrovascular risk in general population.[17]

In current study twenty five percent subjects had features of congestive heart failure. This

can be considered as cardiac decompensation with the existence of other risk factors including hypertension, dyslipidemia and diabetes that also affect the cardiac vascular system. In present study, the mean homocysteine levels was 98.68±44.14, Graham, et al showed that homocysteine levels was significantly higher in patients with IHD.[18] Alam N, et al also reported that two fold increase in MI occurred in subjects with a mean concentration of homocysteine >15 μmol/L.[19]

In present study the hyperhomocysteinemia was predominant in male population while the studies conducted in neighbor country and abroad also shown male gender had high homocysteine levels as compared to females the reason might be more muscle bulk in male gender.[20,21] There was an increase in homocysteine levels in advance age and according to the studies conducted by Ravaglia G, et al and Dominguez LJ, et al shown that hyperhomocysteinemia was prominent in advance age.[22,23]

Therefore, our study though presenting the view that raised homocysteine levels is associated with IHD needs further verification in large prospective multidisciplinary and advance studies.

CONCLUSION
It was concluded that hyperhomocysteinemia was associated with ischemic heart disease (62%) with advance age and male gender predominance (66%), the absence of hypertension in patients with IHD was also found to have raised homocysteine levels thus proved the association between IHD and homocysteine.
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
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PREVIOUS RELATED STUDY

Mukhtar Ahmad, Khemomal Kharira, Zia ur Rehman. ISCHEMIC HEART DISEASE EVENTS IN DIABETIC PATIENTS HAVING HYPOMAGNESEMIA (Original) Prof Med Jour 10(3) 220 - 222 Jul, Aug, Sep,2003.

Muhammad Hanif Nagra, Ahmad Bilal, Muhammad Shahid, Khalid Amin. INCIDENCE OF ISCHEMIC HEART DISEASE IN PATIENTS WITH NON INSULIN DEPENDENT DIABETES MELLITUS (Original) Prof Med Jour 11(3) 320-327 Jul, Aug, Sep, 2004.

AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Dr. Mashooq Ali Dasti	Drafting the article and shares its expert research opinion and experience in finalizing the manuscript	
3	Muhammad Sajid Abbas Jaffri	Contributed in conception and interpretation of data and give his expert view for manuscript designing	
4	Dr. Hamid Nawaz Ali Memon	Analysis and interpretation of data contributed in conception and shares its expert research opinion	
5	Dr. Athar Hussain Memon	Drafting and data collection	
6	Dr. Zulfiqar Ali Qutrio Baloch	Drafting interpreting and analyzing the data	
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