

Original Research Article

**TO STUDY PRONE OF IRON DEFICIENCY ANEMIA
PATIENTS TO CARDIOVASCULAR DISEASE**

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Abstract:

Background & Method: The aim of the study is to study Prone of Iron Deficiency Anemia Patients to Cardiovascular Disease. Only subjects diagnosed with iron deficiency anaemia with haemoglobin levels <10 gm% were included in the study. Patients with diagnosed cardiovascular disease, those who are suffering from any major chronic illnesses like diabetes, hypertension or any other endocrine disorder, patients on long term medications and pregnant women were excluded from the study.

Result: Negative correlation (<0.3) were found between serum ferritin and MDA and homocysteine. Also negative correlation was found between MDA and homocysteine. Thus, an inverse relation exists between serum ferritin and markers of oxidative stress.

Conclusion: Cardiovascular disease often goes unrecognized in patients with IDA; therefore, it is essential to carefully assess all patients shortly after the diagnosis of IDA is made. IDA patients have elevated levels of MDA and homocysteine than the control group and both these parameters are common mediator in the pathogenesis of accelerated atherosclerosis. Thus, we conclude that parameters of oxidative stress and homocysteine can help in assessment of cardiovascular status and improvement of health status in IDA patients.

Keywords: Iron, Deficiency, Anemia & Cardiovascular.

Study Designed: Observational Study.

1. Introduction

Patients with iron deficiency will have higher morbidity rates presenting with symptoms of hyper viscosity such as cerebrovascular accidents, cyanotic spells, anorexia, exercise intolerance, poor appetite, poor weight gain, irritability and poor mental development[1]. Treatment of iron deficiency has been shown to reverse all these symptoms[2]. Hyper viscosity symptoms occurred at a lower PCV level (0.52-0.58) among cyanotic patients with iron deficiency as compared to those who were iron sufficient where symptoms occurred at the mean PCV of 0.68.5 Among the iron deficient group, hyper cyanotic symptoms were relieved with iron supplements, and this symptomatic relief was accompanied by an average hemoglobin rise of 2.1g/dl. It is important to mention that cardiac programs are not fully

established in our part of world like in many developing countries subsequently have lot of patient with unoperated congenital heart defect[3].

Blood is a specialized connective tissue with complete and unchangeable identity. It provides one of the means of connection between the cells of different parts of the body and external environment. In modern medicine blood transfusion is an important measure for replacing blood loss. Commonly occurring antigens and hundreds of other rare antigen have been found in human blood cells, especially on the surfaces of the cell membranes[4]. Most of the antigens are weak and therefore are of importance principally for studying the inheritance of genes to establish parentage. Two particular types of antigens are much more likely than the others to cause blood transfusion reactions. They are the *O-A-B* system of antigens and the *Rh* system. ABO and Rh are recognized as the major clinically significant blood group antigens[5].

The rhesus blood group system was the fourth system to be discovered. The ABO blood group individuals are divided into four major blood groups, namely, A, B, AB and O, according to the presence of antigens and agglutinins. Blood group A blood has type A antigens, blood group B has type B antigens and blood group O has neither A nor B antigens[6].

2. Material & Method

The study enrolled 40 randomly selected subjects in the age group of 19-40 years diagnosed with iron deficiency anaemia, irrespective of their socio-economic status from Amaltas Institute of Medical Sciences, Dewas, M.P. for 01 Year and 40 controls not having iron deficiency anaemia. Only subjects diagnosed with iron deficiency anaemia with haemoglobin levels <10 gm% were included in the study. Patients with diagnosed cardiovascular disease, those who are suffering from any major chronic illnesses like diabetes, hypertension or any other endocrine disorder, patients on long term medications and pregnant women were excluded from the study. Any patient not willing to cooperate after initially signing the informed consent was allowed to withdraw from the study.

The outcome was assessed in terms of the role of homocysteine and Malondialdehyde in iron deficiency anaemic patients. 5 ml of venous blood sample was collected in a plain bulb from the patients as well as the controls. Complete blood count and Serum ferritin was done using ELISA kit.

3. Results

Table-1: Results of parameters to be correlated

PARAMETERS	CONTROLS Mean+ SD	CASES Mean+ SD
Hb (gm%)	112.093+2.067	+826+2.169
Serum ferritin (ng/ml)	96.53+4.699	9.224+1.142
MDA (ng/ml)	0.144+0.102	0.680+0.349
Homocysteine (ng/ml)	26.57+2.11	75.105+6.836

P value for Hb – 0.003, for ferritin - <0.0000001, for MDA -<0.0000001 and for Homocysteine – <0.0000001

Table-2: Correlation

Correlation between		r-value	p-value
Serum ferritin	MDA	-0.0243	<0.0000001
	Homocysteine	-0.136	<0.0000001
MDA	Homocysteine	-0.119	<0.0000001

Negative correlation (<0.3) were found between serum ferritin and MDA and homocysteine. Also negative correlation was found between MDA and homocysteine. Thus, an inverse relation exists between serum ferritin and markers of oxidative stress.

4. Discussion

In our study, the distribution of blood group B was the highest with a percentage frequency of 68%, followed by blood group O and A with a percentage frequency of 63 and 45% respectively and the least percentage frequency is that of blood group AB which is 22%. The prevalence of anaemia in our study was found in blood group B, followed by O, AB and then A. The same trend of prevalence of blood groups (B>O>A>AB) was observed[7]. In many other studies, blood group O has been found to be the most common blood group. The frequency of Rh+ve was about 97.4%, while 2.7% were Rh-ve in our study. Similar patterns of distribution were also observed in other studies. Thus, the frequencies of ABO and rhesus blood groups vary from one population to another. On further evaluating the distribution of subjects according to blood groups and their relationship to anemia it was found that anemia was more frequent in blood group B (41.2%) followed by blood group AB (40.0%), A (33.3%) and least in the blood group O (25.8%) but it was not statistically significant (p=0.122) [8].

Similar findings were seen in the study conducted by Basak Asim Kumar, 5 in which individuals having blood group B, A or AB were prone to anemia compared to blood group O but was statistically significant. On the other hand, there was no such relationship between Rh factor and the occurrence of anemia between the above mentioned populations. Anemia during adolescence severely impairs the physical and mental development; weakens behavioral and cognitive development; reduces physical fitness; decreases the work performance and even contributes to the adverse pregnancy outcome Mild anemia can adversely affect the productivity and is also known to reduce the immune-competence[9]. The average prevalence of anemia is 25-80% seen in several studies across the Indian subcontinent in a study conducted by ICMR in sixteen districts in eleven different states reporting a prevalence rate of anemia 90.1% among the adolescent girls of 11-18 years age

groups. In their study, 35% anemia was seen in the 300 students studied. In further evaluating gender wise it was found that anemia was significantly more in the girls (44.8%) compared to the boys (17.6%) with a 'p' value of 0.0001. The similar higher prevalence of anemia was found in the rural girls (98%) and boys (56%)[10].

5. Conclusion

Cardiovascular disease often goes unrecognized in patients with IDA; therefore, it is essential to carefully assess all patients shortly after the diagnosis of IDA is made. IDA patients have elevated levels of MDA and homocysteine than the control group and both these parameters are common mediator in the pathogenesis of accelerated atherosclerosis. Thus, we conclude that parameters of oxidative stress and homocysteine can help in assessment of cardiovascular status and improvement of health status in IDA patients.

6. References

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