



ISSN NO. 2320-5407

*Journal homepage: <http://www.journalijar.com>***INTERNATIONAL JOURNAL
OF ADVANCED RESEARCH****RESEARCH ARTICLE****EFFECT OF ANAEMIA ON SERUM CHOLESTEROL LEVEL IN MIDDLE AGED
WOMEN****Sivapriya. A* and Santhanalakshmi. L**
Madurai Medical College, Madurai, Tamilnadu**Manuscript Info****Manuscript History:**

Received: 15 September 2015
Final Accepted: 22 October 2015
Published Online: November 2015

Key words:

hypercholesterolemia, dyslipidemia,
cholesterol, anemia

Corresponding Author*Sivapriya. A****Abstract**

BACKGROUND: Anaemia is a widely prevalent public health problem where there is reduced delivery of oxygen to the tissues. Cholesterol is an important substance present in every cell membrane of our body. In this study serum cholesterol level in anaemic women is investigated for any association.

AIM: To study the effect of anaemia on serum cholesterol level in BMI matched middle aged women.

MATERIALS AND METHODS: After getting ethical committee approval, in this cross sectional study, BMI matched middle aged women attending Government Rajaji Hospital as outpatients were selected. Women with Hb>12 gm/dl (n=40) were taken as control group and women with Hb<12 gm/dl (n=40) were taken as study group and estimation of serum cholesterol was done for all of them.

RESULTS: Statistical analysis of haemoglobin concentration and serum cholesterol level among the participants was done by **one way ANOVA** and the results were compared between the study and control group. Mean serum cholesterol level was significantly ($p < 0.001$) reduced in study group (144.975 mg/dl) as compared with control group (171.925 mg/dl).

CONCLUSION: In our study, blood haemoglobin levels correlated significantly with serum cholesterol concentration. In patients with anaemia, the lipid levels should be interpreted with caution.

Copy Right, IJAR, 2015.. All rights reserved

INTRODUCTION

Anaemia is a widely prevalent morbid condition in our country and it is more common among females. In this disorder haemoglobin concentration is below the normal range for the age and sex of the subject. Reduction in haemoglobin concentration leads to decreased oxygen carrying capacity of blood leading to tissue hypoxia. This results in various clinical manifestations like generalized muscular weakness, breathlessness, tiredness, palpitations, anorexia, menstrual disturbances etc.

According to **WHO**, for non pregnant females Hb<12 gm/dl is considered as anaemia which can be subdivided into mild anaemia with Hb 11-11.9 gm/dl, moderate anaemia with Hb 8-10.9 gm/dl and severe anaemia with Hb<8 gm/dl.

Cholesterol is an essential chemical in our body despite typically known as something to avoid. It is used to produce cell membranes, hormones, bile acids, vitamin D etc. **National Cholesterol Education Programme** defines serum cholesterol level between 160-199 mg/dl as desirable.

So anaemia is a widely prevalent public health problem and cholesterol is an important substance present in every cell membrane of our body. In this study serum cholesterol level in anaemic women is investigated for any association.

AIM

To study the effect of anaemia on serum cholesterol level in BMI matched middle aged women.

STUDY DESIGN

It is a cross sectional study including 80 non pregnant middle aged women in which 40 anaemic women were selected as study group and 40 non anaemic women were selected as control group.

In study group 40 women of age 30-40 years attending Government Rajaji Hospital as out patients with blood haemoglobin level <12 gm/dl were included. In control group 40 women of age 30-40 years attending Government Rajaji Hospital as out patients with blood haemoglobin level >12 gm/dl were included.

INCLUSION CRITERIA

1) Age between 30-40 years 2) Regular menstrual periods 3) Normal BMI 18.5-25 kg/sq.m.

EXCLUSION CRITERIA

1) Obesity, Malnutrition 2) Diabetes mellitus or RBS > 200mg/dl 3) Hypertensive or BP > 140/90mmof Hg 4) Blood urea > 40mg/dl or Creatinine > 1.4mg/dl 5) SGOT > 40U/L, SGPT > 40U/L, ALP >250U/L 6) Smokers and Pregnant women 7) Thyroid disorders /Ischaemic heart disease /Cerebro vascular disease 8) History of recent blood loss 9) History of use of steroids, statins, oral contraceptives etc

MATERIALS AND METHODOLOGY

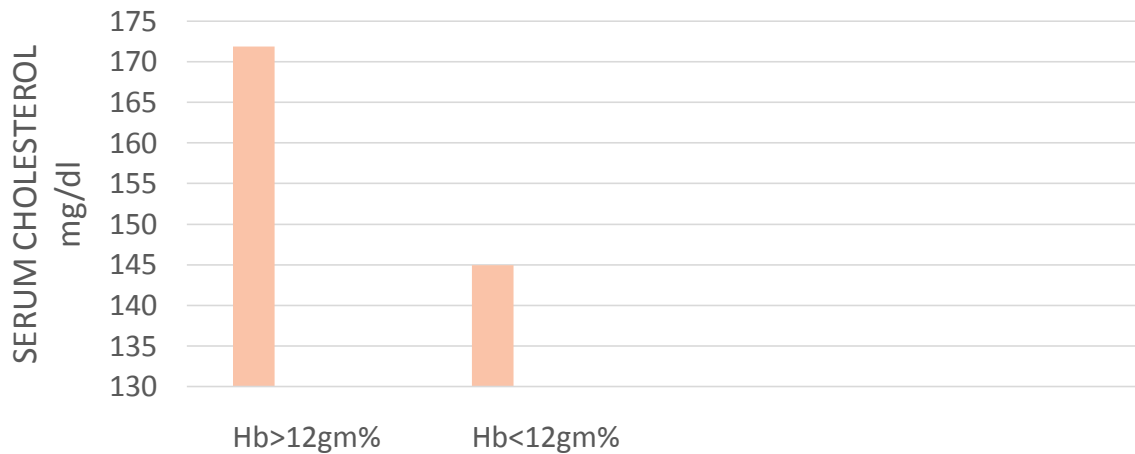
After getting approval from the ethical committee, subjects were selected from the out patient department of Government Rajaji Hospital. Informed and written consent were obtained from them. Detailed medical history, general and systemic examination were carried out. Eligible candidates for the study were selected and routine biochemical investigations were done. Haemoglobin concentration was estimated by spectrophotometric method and are divided into women with Hb>12 gm/dl as control group and study group with women having Hb< 12gm/dl. For all of them 2ml of venous blood was taken after 10-12 hours of fasting and estimation of serum cholesterol was done by enzymatic method.

RESULTS AND ANALYSIS

Statistical analysis of haemoglobin concentration and serum cholesterol level among the participants was done by **one way ANOVA** and the results were compared between the study and control group. A 'P' value of < 0.01 is considered significant. Mean serum cholesterol level was significantly (p < 0.001) reduced in study group (144.975 mg/dl) as compared with control group (171.925 mg/dl).

Serum cholesterol (mg/dl)	Control group (Hb>12gm%) n=40	Study group (Hb<12gm%) n=40	P value
MEAN	171.925	144.975	<0.001 (significant)
STANDARD DEVIATION	24.601	18.638	

MEAN VALUE OF SERUM CHOLESTEROL

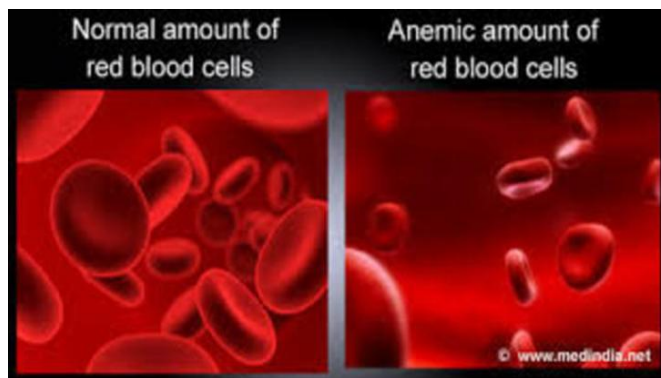


When anaemic women are divided into mild and moderately anaemic with Hb 8-11.9 gm/dl and severely anaemic with Hb < 8 gm/dl again there is a significant reduction ($p < 0.001$) in mean value in serum cholesterol (155.5 mg/dl vs 134.45 mg/dl)

SERUM CHOLESTEROL mg/dl	MILD & MODERATE ANAEMIA Hb 8 -11.9 gm/dl (n=20)	SEVERE ANAEMIA Hb < 8 gm/dl (n=20)	P VALUE
MEAN	155.5	134.45	< 0.001 (significant)
STANDARD DEVIATION	18.077	12.369	

MECHANISM

The exact mechanism by which anaemia causes a fall in serum cholesterol level is not known. The simplest explanation proposed is a dilution effect of the increased volume of serum in anaemia carrying the same total load of cholesterol.



The other possibilities are in anaemia, there is an increase in rate of red blood cell production which increases the utilization of cholesterol and decreased endogenous synthesis of cholesterol by the liver due to decreased liver oxygenation.

DISCUSSION

Framingham heart study states that both increase and decrease in level of serum cholesterol increases the risk for coronary heart disease and the desirable range is 160-199 mg/dl. It is hypothesized that low haemoglobin exert an additional protective effect against atherosclerotic heart disease by lowering lipid levels. But anaemia can cause severe life threatening conditions like angina, cardiac failure etc. So to maintain low blood cholesterol level, anaemia is not a healthy way to obtain this result and the desirable cholesterol level can be maintained by diet, exercise and other lifestyle modifications.

CONCLUSION

In our study haemoglobin concentration correlate significantly with serum cholesterol level. So in patients with anaemia the lipid levels should be interpreted with caution. Both reduction in haemoglobin and blood cholesterol level can lead to various medical problems. To maintain low blood cholesterol level anaemia cannot be promoted.

REFERENCES

- 1) NarraSandeep, V Dharma Rao, A Hanumaiah, DilipRampure. Lipid profile changes in Anemia, Transworld Medical Journal ISSN : 2347-2790
- 2) Jong Weon Choi, Soon Ki Kim, and Soo Hwan Pai. Changes in Serum Lipid Concentrations during Iron Depletion and after Iron Supplementation, Annuals of Clinical & Laboratory Science, vol.31, no. 2, 2001
- 3) VenkateshwarluNandyala, Gandiah P., Karthik R.S.,SivarajappaP.,IndiraG.,Krishna Prasad T., A Study of Lipid Profile in Iron Deficiency Anemia, Int Journal of Recent Trends in Science And Technology, ISSN 2277-2812 E-ISSN 2249-8109 Vol 9, Issue 2, 2013
- 4) Vijaykumar B. Antappanavar, Shivraj G. Biradar, Veerendrapatil, Prithviraj M. Biradar, ShivkumarMithare, Ashishkumar Sharma. A study of correlation between iron deficiency anaemia and serum lipid profile in Indian adults in BRIMS, Bidar. Int Journal of Advances in Medicine 2014 Aug;1 (2) : 96-100