

A COMPARATIVE STUDY OF HAEMOGLOBIN CONCENTRATION IN INDIAN NON-VEGETARIAN AND VEGETARIAN POPULATION OF AGED 18 TO 40 YEARS.

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Abstracts: Background: Haemoglobin level and pattern of food intake is closely associated with each other. In India due to the various socio-economic and religious beliefs, the dietary habits vary amongst different populations. **Method:** The study was conducted on non-vegetarians and vegetarians males and females. A total of 100 subjects were enrolled (50 males and 50 females) for the study. The Anthropometric measurements viz. height, weight, BMI and, BP, were taken and haemoglobin level (gm %) was assessed in non-vegetarian and vegetarian. **Results:** Our results showed that haemoglobin level (14.05 ± 1.051 gm %) in non-vegetarian males and in vegetarian males was (12.2 ± 0.86 gm %) high than vegetarian. Haemoglobin level (12.2 ± 1.031 gm %) in non-vegetarian females and in vegetarian female was (10.35 ± 1.091 gm %) high than vegetarians. **Discussion:** Thus Haemoglobin Level (gm%) of non-vegetarians were high in males and females than vegetarians. Due to Some nutrients intake, haemoglobin level was better in non-vegetarians than vegetarians.

Key Words: Haemoglobin, Non-Vegetarian, vegetarian.

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Introduction: In India due to the various socio-economic and religious beliefs, the dietary habits vary amongst different populations¹. A well-planned and varied vegetarian diet is perfectly consistent with good health and can potentially reduce the risk of many chronic diseases¹. Population who were practicing meatless dietary regimen most frequently reported low energy intake, along with low levels of vitamins and minerals particularly B-complex, calcium, iron, and zinc¹.

Anaemia is an important health issue throughout the world with the highest prevalence rate being seen in developing countries². Dietary factors play an important role in the development of iron deficiency. The dietary factors of greatest influence over one's iron status include the form of iron consumed and any factors affecting its bioavailability².

Anaemia is an indicator of both poor nutrition and poor health³.

Prevalence of anaemia: According to World Health Organization, the global prevalence of anaemia is 24.8%, which means about 1.62 billion people worldwide³. India is facing a grave public health problem, with the prevalence of anaemia in India being > 40%. It is generally assumed that 50% of the cases of anaemia are due to iron deficiency, but the

proportion may vary among population groups and in different areas according to the local conditions³.

Material and Methods: This study was an observational and conducted in a tertiary care hospital. Participates from different departments, willing for the study, of the same institute was the study population. Duration of the study was eighteen months. The study began after obtaining permission from the Institutional Ethics Committee. A written informed consent was taken from every participant before enrolling them in the study. A total of 80 patients were enrolled in the study. History taking, general and systemic examination, detailed diet history taken.

Two groups of parameters were measured:

- (1) Male, (1a) non-vegetarian and (1b) vegetarian.
- (2) Female, (2a) non vegetarian and (2b) vegetarian.

Biochemical Analysis:

Blood samples were collected under all aseptic precaution from a figure prick. The haemoglobin was measured by Sahli's method with a standard component of Sahli's haemoglobinometer.

Statistical analysis:

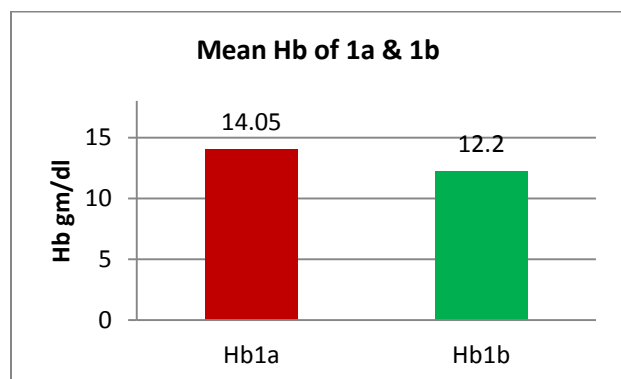
Baseline study participant characteristics were described using descriptive statistics. All the parametric data was expressed as mean \pm SD and non-parametric as median & range of values. The data was analysed statistically using the unpaired t-

test. P value <0.05 was considered significant for all statistical analysis, moderately significant if P<0.01 and highly significant if P<0.001. Confidence interval was calculated as 95%.

Result:

Mean Haemoglobin non-vegetarian (1a) & vegetarian (1b) males Haemoglobin concentration

Characteristic	1a(n=20)	1b(n=20)	Total
Mean Hb gm/dl	14.05 ± 1.051	12.2 ± 0.860	13.12 ± 1.333
P value is 0.004 using unpaired t test. P value < 0.05 is considered significant			

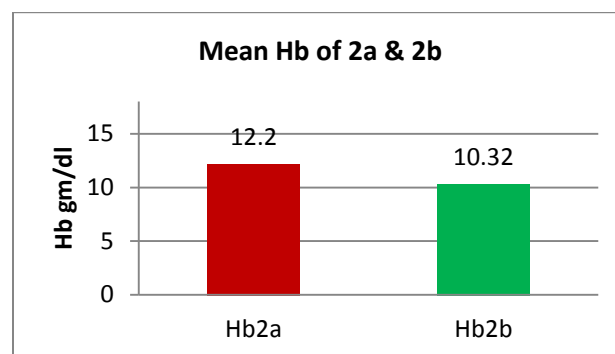


Mean Haemoglobin of non-vegetarian males & vegetarian males

The mean haemoglobin of subjects enrolled between 18 and 40 years of age was 13.12 ± 1.333 gm/dl. Mean haemoglobin in group 1a was observed to be 14.05 ± 1.051 gm/dl which was significantly higher than the mean haemoglobin in group 1b (12.2 ± 0.860 gm/dl). Using unpaired t test, a statistically significant difference was noted in the mean haemoglobin of subjects between the 1a & 1b groups.

Mean Haemoglobin nonvegetarian(2a) & vegetarian (2b) females
Haemoglobin concentration

Characteristic	2a(n=20)	2b(n=20)	Total
Mean Hb gm/dl	12.2 ± 1.031	10.35 ± 1.091	11.262 ± 1.441
P value is 0.008 using unpaired t test. P value < 0.05 is considered significant			



Mean Haemoglobin of non-vegetarian females & vegetarian females

The mean haemoglobin of subjects enrolled between 18 and 40 years of age was 11.262 ± 1.441 gm/dl. Mean haemoglobin in group 2a was observed to be 12.2 ± 1.031 gm/dl which was significantly higher than the mean haemoglobin in group 2b (10.35 ± 1.091 gm/dl). Using unpaired t test, a statistically significant difference was noted in the mean haemoglobin of subjects between the 2a & 2b groups.

Discussion:

In India due to the various socio- economic and religious beliefs, the dietary habits vary amongst different populations. Haemoglobin level and pattern of food intake is closely associated. A well-planned and varied vegetarian diet is perfectly consistent with good health and can potentially reduce the risk of many chronic diseases. Multiple benefits of vegetarian dietary practices that extend to enhanced physical fitness and performance have been explored since the early 20th century⁴. Vegetarians most frequently reported low energy intake, along with low levels of vitamins and

minerals particularly B-complex, calcium, iron, and zinc. However vegetarian diets can meet the nutritional requirements with appropriate selection of foods. Anaemia is an important health issue throughout the world with the highest prevalence rate being seen in developing countries. It is the most prevalent nutritional deficiency disease world-wide⁴.

Overall health status of a person is judged on level of haemoglobin of a person. Dietary factors play an important role in the development of iron deficiency. The dietary factors of greatest influence over one's iron status include the form of iron consumed and any factors affecting its bioavailability. Vegetarianism has become increasingly popular among people including adolescents in current years perhaps because this diet is believed to offer health benefits. Nevertheless, there are still justified concerns about some critical nutrients whose lack may cause serious nutritional deficiencies, especially as diverse groups of women may have very different motivation to follow a vegetarian diet⁵. Haemoglobin determination is regarded as a screening index useful in defining various degrees of iron deficiency anaemia. It has been recommended that anaemia may be diagnosed carefully and confidently when the haemoglobin concentration is lower than the level considered normal for the person's age and sex therefore, the measure of haemoglobin in circulating blood is one of the best laboratory tests for screening of anaemia⁵.

Non-heme iron absorption may be improved by vitamin-C or an acid diet but not by and alkaline diet or high fibre diet, both of which exist in vegetarian diets. The frequency of intake was recorded in terms of their frequency like twice a day, alternate day, weekly etc. and food stuffs have been categorized like cereals, pluses, vegetables, milk and milk products, eggs, meat, chicken, etc. India is facing a grave public health problem, with the prevalence of anaemia in India being > 40%. Anaemia is an indicator of poor nutrition and poor health with major consequences for the human health, as well as for the social and economic development of a population. Anaemia is a global public health problem affecting both developing and developed countries with major consequences

for human health as well as social and economic development. It occurs at all stages of the life cycle⁶.

Conclusion:

Iron deficiency, the primary contributor to anaemia, is the most widespread nutritional disorder while other micronutrient deficiencies including folate and vitamin B12 also contribute to anaemia. Nutritional deficiencies, mainly of iron, caused by inadequate diet is the predominant cause of anaemia in the South- East Asia Region. South Asian diets are mostly based on staples with little intake of animal foods, have low iron bio-availability and contain inhibitors of iron absorption, so that intake and/or absorption of iron and other nutrients is inadequate for haemopoiesis. Iron responsive anaemias are estimated as 40-50% of anaemias in the Region⁶.

In this study we found that concentration of haemoglobin in non-vegetarian population is more than vegetarian population. In vegetarian population, who consumes good vegetarian diet, which contains green leafy vegetables, milk and milk products etc. haemoglobin is less than non-vegetarian population but within normal range. So a complete vegetarian diet is always good for keeping haemoglobin within normal limit. Non-vegetarian diet increases haemoglobin more as compare to vegetarian diet, if contain red meat related to other cardio vascular problem.

Finally we saw that how haemoglobin concentration is affected with diet, non-vegetarian, vegetarian, number of meals per day, quality of food products.

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References:

1. Khanna, G.L, Lal, P.R., Kommi, K.& Chakraborty, 'A Comparison of a Vegetarian and Non-Vegetarian Diet in Indian Female Athletes in Relation to Exercise Performance' Khanna et al Journal of Exercise Science and Physiotherapy, 2006, Vol. 2: 27-34,
2. Kamla Mahajani and Vibha Bhatnagar, Comparative Study of Prevalence of Anaemia in Vegetarian and Non-Vegetarian Women of

Udaipur City, Rajasthan, Journal of Nutrition & Food Science 2015, S3,1-6.

3. Shyam Vinay Sharma, Sciddhartha Koonwar, Virendra Atam, Uma Singh, M L Patel, 'study of haemoglobin in vegetarian and non-vegetarian diet in obese women with risk of cardiac problem in Lucknow city'. National journal of medical research June 2013, Volume 3, Issue 2 April – June 2013, 169-170
4. Ketan Mangukiya, Umesh Kumar Pareek, Avdhesh Kumar Sharma, Neha Sharma, 'Haemoglobin Study in Vegetarian and Non Vegetarian Obese Females of Udaipur City' Mangukiya-et-al. IJCBR 2014; 1(1): 54-58.
5. S.Patel, M Shah, J Patel, N. Kumar, Iron Deficiency Anemia In Moderate to Severely Patients, Gujarat Medical Journal, August 2009, Vol.64 No.2
6. Prashanth Thankachan, Sumithra Muthayya, Thomas Walczyk, Anura V. Kurpad, and Richard F. Hurrell, 'An analysis of the etiology of anemia and iron deficiency in young women of low socioeconomic status in Bangalore, India', Food and Nutrition Bulletin, 2007, vol. 28, no. 3.328-336

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