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Anemia among Apparently Healthy Looking Male Industrial Workers of North West Karnataka

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ABSTRACT

Introduction: Anemia is a known serious health issue among Indians. Survey suggests it is very common among childhood, adolescent females and pregnant, lactating females in India. Efforts are taken to exterminate anemia but nothing much has changed in the numbers from 1993 to 2016. Male population is prejudiously considered to be devoid of this condition but it is not so.

Aim: The present study was aimed to investigate the incidence of anemia among 700 apparently healthy looking male industry workers in 18 and 59years age group.

Results: Among 700 apparently healthy looking male industry workers 18.71% were mildly anemic, 22.29% were moderately anemic and 7.86% were severely anemic. Incidence of anemia was about 60% in low and moderate income group. Amid 462 tea/coffee consumer and habit of chewing or smoking of tobacco 21.55% were severely anemic, 17.93% were moderately anemic. In a group of 154 alcohol consumers 13% were severely anemic, 6% displayed moderate anemia.

Conclusion: Apparently healthy looking males are equally prone to anemia. Certain occupational restrains, adapted food practices and succumbed habits make them prone.

Keywords: Anemia, Males, Industrial workers, Alcoholism, Tobacco consumer, Healthy male

INTRODUCTION

Lethargy, lazy feeling, early fatigue, frequent fevers, recurring infections, loss of mood to do the task are some of the factors which affect productive life of an individual. In turn these contribute to loss of productive man power and a cause to slowdown the economic growth of a nation as whole. There are multiple factors which may develop such symptoms in an individual, but when looked in to the root cause of such behavioral changes, individual's nutrition can be one of the factors. Iron, a micronutrient required in milligram quantity, is an important element for the synthesis of hemoglobin. Hemoglobin is required for the transport of oxygen which help in oxidation of nutrients and there by the production of energy in the body. Thus iron can have great impact on efficiency and health of an individual.

When hemoglobin content of blood decreases than normal it is called Anemia. It may be due to lack of one or more essential nutrients [1,2]. Anemia is a known serious health issue among Indians. A report from 2016 survey indicates an average prevalence of 51.0% among females and 57.3% among less than 5 year age children of India [3,4]. ICMR study conducted in eleven different states of India reveals 84.9% women are anemic during pregnancy, among them 9.9% have severe anemia [5]. A study conducted by Nutrition Foundation of India in seven different states of India during 2002-2003 reported 86.0% prevalence among which 9.3% were severely anemic [6]. Two decade study conducted on 9 to 36 month babies in urban slum area by Kapur et al. [7] presented 64% prevalence with 7.8% severely anemic.

Thus survey suggests anemia is very common in childhood, adolescent females and adult females in India [8]. Lot of effort are taken by government organisations (GO) and Non-Government Organisations (NGO) to bring down the percentage incidence of anemia in female population of India. Even after extensive nutritional programmes

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conducted by GO and NGOs, nothing much have changed in the numbers from 1993 to 2016 [3,4,9]. Complete focus of anemia elimination is concentrated on female population only. On the other hand males are prejudiously considered to be devoid of this condition but it is not so. Community survey reports from various parts of world suggest prevalence of anemia in apparently healthy looking males is equally bad [10]. The present study was aimed to investigate the incidence and cause of anemia among apparently healthy looking male industry workers from north-west Karnataka state.

MATERIALS AND METHODS

The present study was performed on apparently healthy looking male industry workers from industrial area around Dharwad (North West Karnataka) to assess incidence and cause of anemia. Study design was cross sectional, non-interventional, observational and descriptive type. The sample size was calculated using formula [11]:

$$n=[Z^2Npq/(N-1)d^2 +Z^2pq]$$

where, z=1.96, p=50%, q=(100-50)=50, d=0.05.

Minimum number of sample required for population study derived by formula was 684. We have included total 700 apparently healthy looking male individuals in our study. The study was approved by institutional ethics committee. The purpose of study was explained to each participant and written consent was obtained from each participant who volunteered for the study. A set of questionnaire having yes/no response type was distributed among participants. The response was collected within two days and subjected for Statistical analysis using SPSS ver.2.1. Independent t test was used for comparison of group values.

Apparently healthy looking male industrial worker of any cadre in the age group of 18 to 59 years from various factories were included in the study. Workers were asked to exclude themselves if their age is less than 18 years and above 60 years, if they have any known blood disorders, severe organ insufficiency, terminal illness or cases of malaria, dengue, filariasis or under treatment of medication which can affect hemoglobin level in blood. Female of all age and obviously males who did not volunteered were excluded.

Required demographic information was collected from the questionnaire and some other required relevant information was collected or verified from HR department of respective factories.

To estimate hemoglobin level 20microlit of blood was collected on Whatman filter paper by finger prick method as explained in Dacie and Lewis [12]. Hemoglobin levels were estimated on colorimeter using cyanmethemoglobinin method. In view of National consultation on control of nutritional anemia in India, study population was categorised in to following four groups:

1. Normal (hemoglobin above 12.0 g/dl)
2. Mild anemic (hemoglobin level 10.1 to 12.0 g/dl)
3. Moderately anemic (hemoglobin level 8.0 to 10.0 g/dl)
4. Severely anemic (hemoglobin less than 8.0 g/dl) [13,14]

RESULTS

In the present study, individual's age ranged between 18 and 59 years having mean age 40.8 ± 13.6 years. Average body weight of participants was 51.7 ± 9.3 kg. Among 700 individuals 65 (9.29%) were bulky and obese whereas 37 (5.29%) were slim and underweight for their age-group.

The mean hemoglobin level among 700 apparently healthy looking male industrial participants was 11.3 ± 4.8 g/dl. Among these 700 individuals 342 (48.86%) participants were anemic and 358 (51.14%) were normal. Among anemic, 131 (18.71%) were mildly anemic, 156 (22.29%) were moderately anemic and 55 (7.86%) were severely anemic **(Table 1)**.

Table 1. Incidence of anemia among apparently healthy looking males.

Anemia group	Hemoglobin range (g/dl)	Number of individuals	Percent incidence
Normal	12.1 to 16.0 or above	358	51.14%
Mildly anemic	10.1 to 12.0	156	18.71%
Moderately anemic	8.1 to 10.0	131	22.29%
Severely anemic	Less than 8.0	55	7.86%

Incidence of anemia among apparently healthy looking males' industrial workers on comparing with their monthly income

Severe anemia was highest among low income group (11.06%) and least among middle income group (5.35%). When compared between three income groups, low and moderate income group expressed high incidences of anemia about 60% whereas, middle income group shows low incidence of 35% **(Table 2)**.

Table 2. Incidence of anemia among apparently healthy males when compared with monthly income.

Income group Rs per month	Number of individuals	Normal	Mildly anemic	Moderately anemic	Severely anemic
5000 to 9000	199 (28.43%)	80 (40.20%)	45 (22.61%)	52 (26.13%)	22 (11.06%)
Low Income gr.					
9001 to 15000	318 (45.43%)	206 (64.78%)	41 (12.89%)	54 (16.98%)	17 (5.35%)
Middle income gr.					
15001 and above	183 (26.14%)	72 (39.34%)	45 (24.59%)	50 (27.32%)	16 (8.74%)
Moderate income gr					
Total	700 (100%)	358 (51.14%)	131 (18.71%)	156 (22.29%)	55 (7.86%)

Incidence of anemia amid apparently healthy male's industrial participants consuming more than 5 cups of tea/coffee per day or habituated to either chewing or smoking of tobacco

Out of 700 apparently healthy male participants 462 (66%) participants were having habit of consuming more than 5 cups of tea/coffee per day or having habit of chewing or smoking of tobacco frequently. Among these 462 subjects 21.55% were severely anemic, 17.93% were moderately anemic, 15.05% were mildly anemic and only 11.47% were having normal hemoglobin levels **(Table 3)**.

Table 3. Incidence of anemia among apparently healthy male tea/coffee or tobacco consumers.

Having Habit of Tea/coffee or tobacco	Normal	Mildly anemic	Moderately anemic	Severely anemic
(462/700) 66%	11.47%	15.05%	17.93%	21.55%

Incidence of anemia among apparently healthy males who disclosed habit of alcohol consumption

Among 700 participants 154 (22%) apparently healthy looking male industrial males disclosed the habit of alcohol consumption. Frequency of alcohol consumption ranged between occasional to regular drinkers. In the group of 154 alcohol consumers 13% were severely anemic, 6% displayed moderate anemia, 1% had mild anemia whereas 2% were having normal hemoglobin level **(Table 4)**.

Table 4. Incidence of anemia among apparently healthy male alcohol consumers.

Habit of Alcoholism	Normal	Mildly anemic	Moderately anemic	Severely anemic
(154/700) 22%	02%	01%	06%	13%

DISCUSSION

Anemia can be defined as a condition in which the Hemoglobin (Hb) content of blood is lower than normal due to deficiency of one or more essential nutrients irrespective of the cause of such deficiencies [1,15]. The problem of anemia is related to wider population than the traditionally considered groups of the pregnant and lactating females, adolescent girls and growing age children. Milder form of anemia remains "silent", i.e., individual does not exhibit any symptoms whereas moderate to severe form is associated with symptoms like fatigue, weakness, dizziness and drowsiness. It may further leads to loss of normal skin color (fair skin), pale lips, tongue and nail if remains unattended. High incidence of anemia (48.86%) observed in present study suspects poor dietary habit, consuming stale tiffin food of low quality with frequent consumption of tea coffee or tobacco. In addition, poor sanitary habits and low income precipitates the anemic condition.

Nutritional deficiency and parasitic infestation are common causes of anemia. Among the most common nutritional

factors contributing to anemia is iron deficiency. Diet that is monotonous and rich in phytates inhibits absorption of dietary iron by the body [16]. Even overcooking of food which destroys heat labile vitamins, inadequate iron intake due to lesser consumption of green vegetables and increased tendency to alcohol addiction are some additional factors responsible for anemia [16]. Excessive consumption of tannin rich tea, coffee [17] and alcohol decreases bioavailability of dietary iron. Poor bioavailability of iron is the major factor responsible for very high prevalence of anemia in the country [2,18].

Hookworm infestation and schistosomiasis also contribute to anemia. A report from Madhya Pradesh states that approximately 44 million pregnant women have hookworm infestation and 20 million people are severely infected with schistosomiasis [19,20]. Poor hygiene among industrial workers may be responsible for observed high frequency of anemia observed in present study.

A study conducted points out Gutkha, tobacco; Niswar aggravates anemia and reports prevalence of 56% anemia among rural Panjabi males [10].

When hemoglobin levels were compared between smokers and non-smokers, a slight contradictory result reveals the higher levels of hemoglobin in smokers which mask anemia this may be to increase in red cell production against tobacco smoke and to compensate altered hemoglobin [10,21]. Another study concludes smoking hinders iron absorption which may contribute to iron deficiency anemia [22]. High incidence of anemia found in low income group indicates poor dietary habits [23]. Frequent use of tobacco products. Increased frequency of anemia among high income group may point towards secondary causes like diabetes, cardiac or renal problems which need to be evaluated [24].

CONCLUSION

Overall impression emerged from present study specifies that apparently healthy looking males are equally prone to anemia. Certain occupational restrains, adapted food practices, poor hygiene and succumbed habits make them more prone. Under social constrains this condition prolongs and leads to severe disease without making it obvious among males.

REFERENCES

1. WHO (2011) Hemoglobin concentrations for the diagnosis of anemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Geneva: World Health Organization.
2. http://nnmbindia.org
3. https://www.indexmundi.com_facts_India_prevalence-of-anemia
4. Kaur K (2014) Anemia ‘a silent killer’ among women in India: Present scenario. Eur J Zoological Res 3: 32-36.
5. Gonmei Z, Toteja GS (2018) Micronutrient status of Indian population. Indian J Med Res 148: 511-521.
6. Agarwal KN, Agarwal DK, Sharma A, Sharma K, Prasana K, et al. (2006) Prevalence of anemia in pregnant and lactating women in India. Indian J Med Res 124: 173-184.
7. Kapur D, Agarwal KM, Agarwal DK (2002) Nutritional anemia and its control. Ind J Pediatr 69: 607-616.
8. Alvarez-Uria G, Praveen KN, M Midde PS, Pakam YR (2014) Prevalence and severity of anemia stratified by age and gender in rural India. Anemia.
9. Ashavaid TF, Todur SP, Dherai AJ (2004) Health status of Indian population - Current scenario. J Assn Phys India 52: 363-369.
10. Kaur IP, Kaur S (2011) A comparison of nutritional profile and prevalence of anemia among rural girls and boys. J Exerc Sci Physiother 7: 11-18.
11. Charan J, Biswas T (2013) How to calculate sample size for different study designs in medical research? Indian J Psychol Med 35: 121-126.
12. Dacie JV, Lewis SM (1991) Hemoglobin estimation. Practical Hematology – Chapter 5, Basic Haematological Techniques. 7th Edn, pp: 37-54.
13. National Consultation on Control of Nutritional Anemia in India (1998) Department of Family Welfare (Maternal Health Division), Ministry of Health and Family Welfare, Nirman Bhawan, New Delhi.
14. Seshadri S (1999) A database on iron deficiency anemia (IDA) in India: Prevalence, causes, consequences and strategies for prevention. Department of Foods and Nutrition. WHO Collaborating Centre for Nutrition Research. The Maharaja Sayajirao University of Baroda, Vadodara, India.
15. Beutler E, Waalen J (2006) The definition of anemia: What is the lower limit of normal of the blood hemoglobin concentration? Blood 107: 1747-1750.
16. Narsinga Rao BS (1978) Iron content, bioavailability and factors affecting iron status of Indians. Ind J Med Res 58: 58-69.
17. Disler PB, Lynch SR, Charlton RW, Walker RB, Mayet F, et al. (1975) The effect of tea on iron absorption. Gut 16: 193-200.
18. Agrawal S, Misra R, Aggarwal A (2006) Micronutrient profile of indian population, New Delhi. Rheumatol Int 26: 1091-1095.
19. Rao VG, Aggrawal MC, Yadav R, Das SK, Sahare LK (2003) Intestinal parasitic infections, anemia and under nutrition among tribal adolescents of Madhya Pradesh. Indian J Community Med 28.

20. Chakma T, Rao PV, Tiwary RS (2000) Prevalence of anemia and worm infestation in tribal areas of Madhya Pradesh. J Indian Med Assoc 98: 567, 570-571.

21. Ashish G, Desh D, Naveen G (2010) Study of relationship of tobacco smoking with hemoglobin concentration in healthy adults. JPBMS 1.

22. http://www.livestrong.com/article/233579-smoking-andvitamin-absorbtion

23. Mehta BC, Patel JC (1969) Anemia in a population with low socio-economic status. Indian J Med Sci 23: 349-357.

24. Bonakdaran S, Gharebaghi M, Vahedian M (2011) Prevalence of anemia in type 2 diabetes and role of renal involvement. Saudi J Kidney Dis Transpl 22: 286-290.