



PREVALENCE OF ANAEMIA AMONGST NURSING STUDENTS- A SURVEY

Shrivastava S¹, Bhattacharjee M^{2*}, Panchmahalkar A³

¹*Dr. Sarita Shrivastava, Reader, Department of Pathology, Bharati Vidyapeeth Dental College and Hospital, Sector 7, CBD Belapur, Navi Mumbai- 400614, Maharashtra.*

²*Dr. Minakshi Bhattacharjee, Reader, Department of Microbiology, Bharati Vidyapeeth Dental College and Hospital, Sector 7, CBD Belapur, Navi Mumbai- 400614, Maharashtra.*

³*Mrs. Ashwini Panchmahalkar, Assistant Professor, Department of Microbiology, Bharati Vidyapeeth Dental College and Hospital, Sector 7, CBD Belapur, Navi Mumbai- 400614, Maharashtra.*

ABSTRACT

Anaemia is a constant hurdle to the healthcare system in offering better care to individuals of lower socioeconomic status. Though anaemia in itself might seem to be less life threatening, in the long term its ill effects may be fatal. The current study tries to assess the prevalence of anaemia among nursing students, who are the future of primary healthcare system. Complete blood count test and anaemia profile was done for 200 nursing students and 44% of them were found to be anaemic. It is worth noting that all the students found to be anaemic were females. A number that makes us ponder upon whether enough is done to screen, create awareness and treat anaemia.

KEYWORDS: *anaemia, CBC, nursing students, complete blood count, haemoglobin, adolescent female, haematology, nutritional deficiency, nutrition*

INTRODUCTION

Anaemia is a major healthcare problem throughout the world, more so in developing nations. Studies have shown that it is more frequent in women of childbearing age.¹ The prevalence is more in developing nations, the main cause being low socioeconomic status and inadequate access to healthcare facilities.² Factors that play a hand in shaping anaemia are numerous, some of them being decreased red blood cell production, blood loss due to various causes and haemolysis leading to increased red blood cell breakdown.³ Blood loss may be induced by conditions like menorrhagia, epistaxis, haematuria, gastrointestinal bleeding, and others. Decrease in production of blood cells can occur due to deficiency of iron, lack of vitamin B12, folic acid, thalassemia, haemolysis because of genetic condition such as sickle cell anaemia, etc.³ The three leading causes of anaemia across the globe are iron deficiency, haemoglobinopathies and malaria. Almost half of the anaemia cases occur due to deficiency of iron and hence, iron is the most

sought after remedy for treatment of the disease. A total of 183000 deaths have occurred due to iron deficiency anaemia in 2013.⁴ Iron deficiency was the number one cause of disability across populations in 2017.⁵ Usually when patients suffer from iron deficiency, the onset of symptoms are gradual and only severe cases of iron deficiency anaemia present with clinically apparent symptoms.⁶ The vulnerable population who suffer from iron deficiency anaemia usually have dietary deficiency due to low intake of iron rich food or due to low bio-availability of dietary iron. Deficiency of iron enhancer or excess of iron inhibitors in diet can also be a contributing factor. Additionally, females usually suffer from iron loss during menstruation and child birth. Another important reason for anaemia is pregnancy in young teenage girls or pregnancy during malaria or other parasitic worm infection.⁷ Statistics show that females usually avoid Iron Folic Acid (IFA) tablets, and only 22.3% of mothers consume IFA tablets for 90 days or more.⁸ There are many nutritional challenges faced by adolescent girls in developing



nations and high prevalence rate of anaemia can be said to be one of the resultant health effects. India also faces this challenge of high anaemia prevalence amongst its adolescent girls.^{3,4} As per WHO, the adolescent period ranges from the age group of 10-19 yrs.⁵ This is a major phase of growth and hence the nutritional requirements are also increased during this period. In India, about 21% of the population are in the adolescent age group.^{6,7} Many studies have been carried out amongst pregnant women and children but fewer studies can be found depicting the true picture of anaemia in adolescent girls.^{2,3}

The aim of this study is to find the incidence of anaemia among male and female students of a nursing college. Since nursing students are the future nurses, primary healthcare workers, they are an important segment of the backbone of our healthcare system. As an initial step, they should be aware of their own nutritional challenges and the incidence of anaemia amongst themselves so that eventually when they extend their nursing care to the community, they can educate the masses about the high prevalence rate of anaemia and the measures that can be taken to reduce that. This study, hence, attempts to understand the trend of anaemia among nursing students and assess the dietary and socio-demographic factors related to the same.

MATERIALS AND METHODS

This study was carried out amongst the students of a nursing college. After taking permission from Institutional Ethics Committee, a total of 200 students were included. Informed consent from the students were also taken prior to investigations. 2 ml of venous blood was drawn in EDTA Bulb taking all aseptic precautions. The anti-coagulated blood was processed in a fully automated 3 part differential haematology analyser (Prokan) for complete blood count. Various parameters like Hb, TLC, DLC, MCV, MCH, MCHC, platelets, RDW were assessed. Peripheral smears were prepared and examined for typing of anaemia. For interpretation of anaemia, the cut-off point for hemoglobin (Hb)% was taken as < 12 g/dL. The severity of anaemia was graded as mild (10 to < 12 g/dL), moderate (7 to < 10 g/dL), and severe (<7 g/dL).^{4,9}

STATISTICAL ANALYSIS

The data obtained was entered into Microsoft excel sheets. This was then exported to SPSS statistical software, version 20.0 to perform relevant analysis.

RESULTS

Among 200 nursing students 40 were males and 160 were females. 88 out of 200 students were anaemic so, the overall prevalence rate was 44%. Males did not have anaemia and 88 female students were anaemic. Out of 88 anaemic females 2 had severe anaemia (Hb<7), 34 had moderate anaemia

(Hb7-10) and 52 had mild anaemia (Hb10-12). We also found out the correlation between hostel stay or home stay and anaemia. It was observed that almost 60 % of anaemic females were boarding in the hostel.

Table 1: Distribution of anaemia among adolescent girls according to severity

Hb (range in g/dL)	Severity of anaemia	No. of girls(n=88)	Percentage
<7	Severe	2	2.27%
7-10	Moderate	34	38.63%
10-12	Mild	52	59.09%

DISCUSSION

Anaemia is a worldwide health challenge though more so in developing nations. In this study we found an overall 44% prevalence of anaemia. Our finding of 44% prevalence rate, with more presence among females is in concordance with the study done by Khan *et al.* They found a 39% prevalence with preponderance among female students (56%) as compared to male students (22%).¹⁰ Likewise, studies in North East Delhi showed 45% prevalence of anaemia.⁸ Whilst Chandrakumari *et al.* observed an overall prevalence of 48.63%.¹¹ Although the overall prevalence of anaemia was 44% (n=88) majority of them, 32.5% had mild anaemia (n=52) with Hb in the range of 10 to 12 g/dL. Similar results were seen in the study of Pandey and Singh, reporting most students of having mild anaemia.¹² Various other studies have reported anaemia prevalence among undergraduate students to be as low as 23% to as high as 55.3%.^{12,13,14}

We found anaemia prevalence to be more common among hostellers as compared to day scholars. Majority of anemic student, girls were staying in hostel that is, away from their homes. Hosteller students usually do not have a proper diet schedule, they may not like the quality of food cooked and served in hostel and hence, may order food from outside. Thus, leading to excessive intake of junk food or skipping of meals. Similar results were shown in the study by Manjula *et al.* that found significant correlation of residential status with anaemia.¹³

The age group considered for the current study was 18-19 years. This age is a challenging period for students owing to the fact that they move out of their homes for further studies and have to adjust their lives in the hostel. Medical and nursing students are more vulnerable to develop anaemia due to irregular eating habits due to hectic study schedule.¹⁵ Students usually do not follow healthy eating habits as they are busy attending their classes. When they are away from home, there are no elders around to remind them about their eating habits. Staying in hostels, skipping meals, clinical postings, long schedules in college and hospital, and many such factors together put them at risk of developing anaemia.¹⁶ They may like and eat fast-food and junk food which usually fail to supply essential nutrients



including iron, thus pushing them towards developing anaemia. Poor eating habits and consumption of unhealthy food are major contributing factors. As students are busy they may skip meals, may not consume healthy fruits and vegetables, and may also consume fizzy drinks which altogether again triggers anaemia. Foods like burger, pasta, bread, pizza contain phytates which can decrease absorption of iron. Unfortunately, nursing students studying about healthcare also follow the same pattern despite having better knowledge of health and better access to health care facilities.^{16,17}

Intervention program on anaemia should be done in college to spread awareness among students. There are certain foods which enhance the absorption of iron like food containing vitamin C (ascorbic acid); absorption of iron increases by 300-350% with a iron ratio of 4:1.⁸ There are certain foods which may act as iron inhibitors like calcium containing foods. Diets containing high fiber and tea/coffee that contain tannins also interfere with iron absorption.⁸ The absorption of iron from mixed cereal-pulse diet is poor (5% in men and children and 8% in all women). Furthermore, infants adolescent and pregnant females have an increased iron requirement. Prevalence of anaemia is >40% across all such vulnerable groups.⁸ Girls usually suffer from anaemia due to increased requirement during puberty and menstruation. In certain societies girls may be neglected due to being a girl child, which may be the reason for malnutrition and in turn anaemia. Additionally, adolescent age group have increased dietary requirements for growth and development. The main cause of anaemia in adolescent age group is growth spurts, hormonal changes, menarche, malnutrition due to change in eating habits, intake of insufficient quantity of iron-rich foods or being on diets.^{9,10,18} It is also worth noting that adolescents usually consume unhealthy and unbalanced diets which may lead to micronutrient deficiency leading to anaemia.¹¹ On the flip side, males do not frequently suffer from anaemia but maybe at risk where there is malnutrition due to inadequate food intake or frequent parasitic infection.

Students suffering from anaemia usually show poor attention span and memory or poor cognition, and this may adversely affect the performance. They may also suffer from repeated infections due to low immunity. Also it may lead to decreased work output and capacity. Studies show that after treatment every 1g/dL increase in hemoglobin level is associated with increase in 1.7IQ points.¹² The first year of nursing programme is the starting of their professional career and hence are need to follow correct eating habits. There has been multiple studies carried out to assess the prevalence of anaemia among medical students entering in professional institutes, but studies specific to nursing students in the current demographic area were not found despite extensive literature review. The current study therefore paves the path of further research in creating awareness on anaemia. It also sows the seeds for introducing

newer interventions that can tackle this neglected problem of anaemia among adolescent students.

CONCLUSION

We found that most of the students suffered from mild anaemia and female students were predominantly affected. Our results show that anaemia constitutes a prominent health problem among female nursing students. The reason could be low intake of iron, menstrual loss and improper eating schedules. Another confounding factor was hostel stay which may have contributed as students usually avoid hostel food and order junk food from outside. Students with anaemia were instructed to follow the balanced diet regimen along with intake of fruits and green leafy vegetables. They were also suggested to regularly monitor their haemoglobin levels. All in all, awareness, screening and nutritional programs with special reference to students is warranted in order to tackle this fairly manageable health condition.

Conflict of Interest: None

Limitation

The types of anaemia were not studied due to the lack of access to advanced laboratory investigations.

REFERENCES

1. Shah BK, Gupta P. Weekly vs daily iron and folic acid supplementation in adolescent Nepalese girls. *Arch Paediatr Adolesc Med* 2002;156:131-5.
2. Kaur S, Deshmukh PR, Garg BS. Epidemiological correlates of nutritional anaemia in adolescent girls of rural Wardha. *Indian J Community Med* 2006;31:255-8
3. Chatterjee R. Nutritional needs of adolescents. *Paediatrics Today* 2008;3:110-4.
4. Kurtz KM, Johnson WC. *The Nutrition and Lives of Adolescents in Developing Countries. The Nutrition of Adolescent Girls Reach Program. Washington, DC: International Centre for Research on Women; 1994.*
5. *Programming for adolescent health and development: WHO Tech. Rep. Sr.no. 886; 1996p2.*
6. Lal S, Pankaj A. Editors. *Textbook of Community Medicine (Preventive and Social Medicine). 1st ed.. New Delhi: CBS Publishers and Distributors; 2007. p. 166-8.*
7. Shobha S, Sharada D. Efficacy of twice weekly iron supplementation in anemic adolescent girls. *Indian Paediatr* 2003;40:1186-90.
8. Aggarwal KN. Assessment of prevalence of anaemia and iron stores in response to daily/weekly iron folate supplements in adolescent girls(10-18) from urban slums of East Delhi. *UNICEF Contract No. 95/0075; 1998. p. i-9.*
9. WHO. *Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Geneva, World Health Organisation, 2011.*



10. Khan B, Sukhsohle ND, Jawadwe P. Prevalence of anaemia among undergraduate medical students of Central India. *Medical Sciences*. 2015; 4:13-1.
11. Chandrakumari AS, Sinha P, Singaravelu S, Jaikumar S. Prevalence of anaemia among adolescent girls in a rural area of Tamil Nadu, India. *J Family Med Prim Care* 2019;8:1414-7.
12. Pandey S and Singh A. A cross sectional study of nutritional anaemia among medical students in a medical college, at Bilaspur, Chhattisgarh. *National journal of medical research*, 2013; Volume 3:143-45.
13. Manjula V D, Parameshwari P, Pothen L, Sobha A. Prevalence of anaemia Among Female Undergraduate Students of Government Medical College Kottayam, Kerala. *Int J Med Health Sci*. 2014, 3; 133-38.
14. Bano R, Ahmad N, Sharma BC, Agarwal A. Nutritional anaemia in the Medical Students. *Indian Medical Gazzete*, 2012: 16-18.
15. Shill KB, Karmakar P, Kibria MG, Das A, Rahman MA, Hossain MS, Sattar MM. Prevalence of Iron-deficiency Anaemia among University Students in Noakhali Region, Bangladesh. *J Health Popul Nutr* 2014; 32:103-110.
16. Pujara K, Dhruva G, Oza H, Agravat A, Dadhania B. Prevalence of anaemia, thalassemia and sickle cell anaemia in medical students: a three year cross-sectional study in P.D.U. medical college, Rajkot. *Int J Res Med*. 2013; 2: 29-32.
17. Javed A, Sharme T, Hazari RS. Evaluation of Prevalence of anaemia and Its Sociodemographic Correlation among Undergraduate Medical College Students - A Cross Sectional Study. *World Journal of Nutrition and Health*. 2017, 5(2), 57-61.