



Original Research Article

A Cross Sectional Study on Anaemia among Patients: A Hospital Based Study

Author

Atul Baid

Assistant Professor, Department of Medicine, Mata Gujri Memorial Medical College and Lions Seva Kendra Hospital, Kishanganj, Bihar, India

Corresponding Author

Dr Atul Baid

Contact: +91 8789430115. Email: dratulbaidmgmmc@gmail.com

Abstract

Anemia 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.

Objective: *Our study was to assess the number of patients who had anaemia.*

Methodology: *A total of 100 patients with anaemia were enrolled in this study. A detail relevant history, clinical examination and investigation were taken to all patients. Haemoglobin (Hb) level was detected by the cyanmethaemoglobin method.*

Results: *Data was analyzed by using simple statistical methods with the help of MS-Office software.*

Conclusions: *Anaemic patients with Age bellow the 30 years, low socioeconomic status and females were commonly suffered with mild anaemia. Female patients with anaemia were relatively high BMI than male patients with anemia.*

Keywords: *Anemia, Socioeconomic status, BMI.*

Introduction

Anemia, defined as a decreased concentration of blood hemoglobin, is one of the most common nutritional deficiency diseases observed globally and affects more than a quarter of the world's population^[1,2].

Anaemia is one of the major public-health problems that affect the world's total population widely^[2]. Anaemia is known to affect people belonging to all age groups, particularly women of child bearing age and children. World Health Organization (WHO) definitions for anaemia are as follows: in children's from 6 months to 5 year,

anaemia is defined as a Hb level <11g/dl, and in children between 5–11 years Hb < 11.5 g/dl^[3]. India has the world's highest prevalence of iron deficiency anaemia among women, with 60 to 70 percent of the adolescent girls being anaemic^[4]. About two billion people are iron-deficient, with half of them manifesting clinical signs of anaemia. It is estimated that 75% of anaemia is related to iron deficiency, followed by folate and vitamin B12 deficiencies^[5]. In developing countries it serves as a primary cause for 40% of maternal death either directly or indirectly. During adolescence anaemia is more prevalent in both

sexes especially in girls where they are exposed risk of onset of menarche. Prevalence of anaemia is very high in vulnerable groups even in higher socioeconomic status.^[1] Anemia is one of the most common health problems in India which is much more prevalent in the rural than in the urban areas. The prevalence of anemia in pregnant and lactating females and children has been found to vary from 50-90% in different parts of India ^[6].

The primary consequences of anemia, even mild anemia in which hemoglobin values are only marginally reduced (>9.5 g/dL), are the impairment of functional capacities and a reduced quality of life ^[7,8]. In elderly persons, anemia can impair physical performance and mobility, thus increasing the risk of falls. An association between anemia in older adults and mortality has been observed in several studies, even in the absence of concomitant illness. In elderly patients, anemia is often overlooked, despite the fact that it has been shown to have potentially serious consequences ^[8].

Anemia is defined as a decrease in the number of red blood cells or the amount of hemoglobin in the blood. When anemia comes on slowly, the symptoms are often vague and may include feeling tired, weakness, shortness of breath or poor ability to exercise. Anemia that comes on quickly often has greater symptoms which may include: confusion, feeling like one is going to pass out, and increased thirst. There needs to be significant anemia before a person becomes noticeably pale.

Anemia has been shown to affect mental development and learning capacity. In infancy it may cause a permanent loss of IQ later in life, shortened attention span, irritability, fatigue, difficulty with concentration, lethargy, weakness and increased susceptibility to infection. Consequently, anemic children tend to do poorly on vocabulary, reading, and other tests (Kordas et al., 2004).^[9]

BMI is defined as weight (in kilograms) divided by height (in meters) squared. As an individual's height and weight can be readily and

inexpensively measured, BMI has become a popular heuristic approximation for body fatness in epidemiology and clinical practice. The World Health Organization defined BMI-based fatness categories of underweight (BMI, 18.5 kg/m²), normal weight (18.5 – 24.9 kg/m²), overweight (25.0 – 29.9 kg/m²) and obese (≥ 30.0 kg/m²).^[10] Excess body weight (overweight and obese) is a major risk factor for mortality and morbidity from cardiovascular disease,^[11] type 2 diabetes^[12] and incident cancer ^[13,14] causing 3 million deaths each year worldwide.^[15] Aim of our study was to evaluate the number of cases with anaemia.

Materials & Methods

A total of 100 patients (males:40, females:60) of anaemia with age group 16 years to 60 years were included in this study. The entire subjects signed an informed consent approved by institutional ethical committee of Mata Gujri Memorial Medical College and Lions Seva Kendra Hospital, Kishanganj, Bihar, India was sought. Data was collected on the basis of inclusion and exclusion criteria, with irrespective of sex in OPD or the ward, of department of Medicine, Mata Gujri Memorial Medical College and Lions Seva Kendra Hospital, Kishanganj, Bihar, during period of March 2017 to June 2017.

Methods

We were excluded the patients who were suffering from any chronic disease like, renal disease, any gastrointestinal disease, diabetes, hypertension, arthritis and those who were taken some medication.

A detail history of patient was taken such as name, age, gender, family history, personal history, socioeconomical status, dietary history, present medical illness and past medical illness. Haemoglobin (Hb) level was estimated by the cyanmet haemoglobin method. Anemia was defined as an Hb of <13 g/dl in males and an Hb of <12 g/dl in females. Mild anemia was defined as an Hb of 10 – 12.9 g/dl in males and an Hb of 10 – 11.9 g/dl in females. Moderate anemia was

defined as an Hb of 7-9.9 g/dl and severe anaemia as an Hb of < 7 g/dl in both males and females. Cyanmethaemoglobin method: This is the method of choice for estimation of hemoglobin and is recommended by International Committee for Standardization in hematology. This is because (i) all forms of hemoglobin are converted to cyanmethemoglobin (except sulfhemoglobin), and (ii) a stable and reliable standard is available.^[16]

We were also measured the Body Mass Index (BMI) of patients with anaemia. BMI was categorized into low (<18.5 kg/m²), normal (18.5-24.9 kg/m²) and high (>25 kg/m²). BMI is calculated as weight in kilograms divided by square of the height in meters.

BMI: Weight in Kilograms/height in meter × height in meter.

Results

A total of 100 patients (40: males, 60: females) of anaemia with age group of 16 to 60 years were enrolled in this study.

Table.1. Gender distribution of patients with anaemia.

Number of patients(n=100)			
Male		Female	
Number	Percentage	Number	Percentage
40	40%	60	60%

In this study, table 1 shows that majority of patients with anaemia were females.

Table.2 Age distribution of patients with anaemia.

Age group (years)	Male		Female	
	Number	Percentage	Number	Percentage
16-30	18	45%	36	60%
31-45	10	25%	14	23.33%
46-60	12	30%	10	16.66%

In our study, 18(45%) male and 36(60%) female were in age group of 16-30 years. 10(25%) male and 14(23.33%) female were in age group of 31-45 years. 12(30%) male and 10(16.66%) female were in age group of 46-60 years. Over all, it was shown that majority of patients with anaemia were female, who were belonged at age group of 16-30 years.

Table.3. Distribution of patients with anaemia

Anaemia	Male(n=40)		Female(n=60)	
	Number	Percentage	Number	Percentage
Mild	18	45%	34	56.66%
Moderate	14	35%	10	16.66%
Severe	8	20%	16	26.66%

Table 3 shows that, 18(45%) male and 34 (56.66%) female were mild anaemia. 14(35%) male and 10(16.66%) female were moderate anaemia. 8(20%) male and 16(26.66%) female were severe anaemia. Thus, we were seen that majority of patients were female with mild type of anaemia.

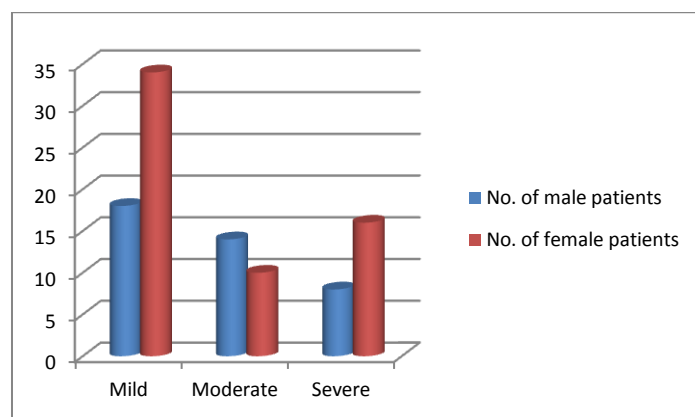


Figure.1. Distribution of patients with anaemia.

Table.4. Socioeconomic status of patients with anaemia.

Socioeconomic status	Male		Female	
	Number	Percentage	Number	Percentage
Low	24	60%	38	63.33%
Middle	13	32.5%	19	31.66%
High	2	5%	3	5%

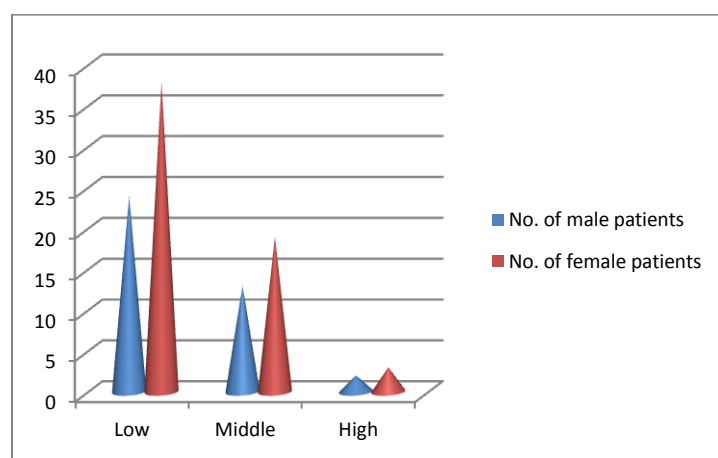


Figure.2. Socioeconomic status of patients with anaemia

In this study, 24(60%) male and 38(63.33) female were belonged with low socioeconomic status. 13(32.5%) male and 19(31.66%) female were belonged with middle socioeconomic status. 2(5%) male and 3(5%) female were belonged with high socioeconomic status. Thus in this study we were seen that female patient was belonged in lower socioeconomic class than male.

Table.5. BMI of patients with anaemia.

BMI	Male		Female	
	Number	Percentage	Number	Percentage
Low	22	55%	22	36.66%
Normal	7	17.5%	12	20%
High	11	27.5%	26	43.33%
Total	40	100%	60	100%

Table 5 shows that 22(55%) males and 22 (36.66%) females patients had low BMI. 7(17.5%) males and 12(20%) females patients had normal BMI. 11(27.5%) males and 26(43.33%) females patients had high BMI. Thus in this study we were seen that majority of patients had low BMI.

Discussion

Anemia is blood related diseases, in which the oxygen carrying capacity is been reduced due to the destruction of the hemoglobin or the RBCs level from its normal range. Iron deficiency with anemia or without anemia has many adverse effects on nervous system, physical response and pregnancy outcome^[17,18].

Our study was conducted in department of Medicine, Mata Gujri Memorial Medical College and Lions Seva Kendra Hospital, Kishanganj, Bihar. We were include 100 patients (40: males, 60: females) with anaemia. Patients who were any chronic diseases like arthritis, renal disease, gastrointestinal disease, diabetes, and hypertension were excluded in this study. Findings of our study shown that majority of patients were female suffering from anaemia. Chitra B, Nisha Nair et al (2014)^[19] supported the finding of our study. They reported the prevalence of anaemia was higher in females in males. S. Patel et al(2009) found the significantly lower hemoglobin levels in woman aged 30 years.^[20]

Iron deficiency is the commonest type of anemia throughout the world and it affects about 50-60% young children and pregnant females and 20-30% of non pregnant females in the developing countries.^[21]

In this study, age group of patient was taken 16-60 years. Results of our study shows majority of patients with anaemia were belonged from age group of 16-30 years. In Age group 16-30 years, anaemia was present in 45 % male and 60% female. Finding shows the females with age 16-30 years were more anemic than males.

The normal hemoglobin concentration in the body is between 12-14 grams percent. WHO has accepted up to 11 gram percent as the normal hemoglobin level in pregnancy. In India and most of the other developing countries the lower limit is often accepted as 10 gram percent.^[22] Anemia is often classified according to Haematocrit (PCV) % as mild degree (9-11 g%), moderate (7-9 g%), severe(4-7 g%), and very severe (<4g%).^[23]

In this study, mild anemia was seen in 45 % males and 56.66% females. Moderate anemia was seen in 35% male and 16.66% female. And severe anemia was seen in 20% males and 26.66% female. Thus we shown that mild and severe anemia was greatly seen in female patients. Out of total cases majority of patients were suffered with mild anemia.

Sant-Rayn Pasricha (2010) conducted a study on Determinants of anaemia among young children in rural India and found that Poor nutrition and low socioeconomic status are the two important primary factors to be considered in anaemia. Strategies for minimizing childhood anaemia must include optimized iron intake but should simultaneously address maternal anaemia, poverty and food insecurity^[24]. N. Arlappa et al (2012) studied on the prevalence of anaemia among rural pre-school children revealed that 59% of pre-school children living in rural areas were anaemic. Therefore, appropriate intervention measures such as supplementary iron & folic acid, periodic deworming and health & nutrition education should be strengthened^[25].

Finding of our study shows that low socioeconomic status patients were higher incidence of anemia. 24(60%) male and 38 (63.33) female were belonged with low socioeconomic status. 13(32.5%) male and 19(31.66%) female were belonged with middle socioeconomic status. 2(5%) male and 3(5%) female were belonged with high socioeconomic status. Thus we were seen that majority of female patients with anemia were in lower socioeconomic class than male.

BMI has become a popular heuristic approximation for body fatness in epidemiology and clinical practice. The World Health Organization defined BMI-based fatness categories of underweight (BMI , 18.5 kg/m²), normal weight (18.5–24.9 kg/m²), overweight (25.0–29.9 kg/m²) and obese (>30.0 kg/m²).^[10] Excess body weight (overweight and obese) is a major risk factor for mortality and morbidity from cardiovascular disease,^[26] type 2 diabetes^[27] and incident cancer,^[28] causing 3 million deaths each year worldwide.

The prevalence of overweight and obesity is increasing dramatically in most parts of the world and is generally higher in women than in men (Organization, 2000).^[10]

In this present study, 22(55%) males and 22 (36.66%) females patients had low BMI. 7(17.5%) males and 12(20%) females patients had normal BMI. 11(27.5%) males and 26(43.33%) females patients had high BMI. Thus in this study, majority of patient had low BMI. And low BMI was greatly seen in male patients and high BMI was greatly seen in female patients with anemia.

Future Research

Science is dynamic and there is always a scope of improvement and change in time to come ahead. With progressive aim to move ahead we aspire to achieve highly accurate and reliable results. Thus every study leaves back scopes for other researcher to do something more advanced and varied in order to touch the height of perfection. This study examined only 100 patients (40: males and 60: females), with anaemia, future researchers

can expand the study by including more number of subjects so as to make generalization of the results and practice, further studies with a larger sample size and in multiple centers are required. Thus it could be applied to real life situation.

Limitation

There were several limitations like, the sample size was small, and it was a hospital-based study, the prevalence of exposure and outcome variables may be different from a community setting.

Conclusions

Our study concluded that aged below the 30 years patients were more suffered with anaemia. Majority of patients were suffered with mild anemia. Female patients were more anemic than male patients. Patients with low socioeconomic status were more prevalent to anaemia. Female patients with anaemia were relatively high BMI than male patients with anemia.

References

1. WHO/CDC, Worldwide Prevalence of Anemia 1993–2005: WHO Global Database on Anemia, WHO Press, Geneva, Switzerland, 2008.
2. Haidar J; Prevalence of Anaemia, Deficiencies of Iron and Folic Acid and Their Determinants in Ethiopian Women. *J Health Popul Nutr* 2010; 28(4): 359-368.
3. World Health Organization; Nutritional anaemias: report of a WHO scientific group (meeting held in Geneva from 13 to 17 March 1967). 1968.
4. Biradar SS, Biradar SP, Alatagi AC, Wantamutte AS, Malur PR; Prevalence of anemia among adolescent girls: a one year cross-sectional study. *Journal of Clinical and Diagnostic Research*, 2012; 6(3): 372-377.
5. Alem M, Enawgaw B, Gelaw A, Kena T, Seid M, Olkeba Y; Prevalence of anemia and associated risk factors among pregnant women attending antenatal care in Azezo

- Health Center Gondar town, Northwest Ethiopia. *J Interdiscipl Histopathol*, 2013; 1(3): 137-144.
6. Schorr TO, Hediger ML. Anaemia and iron-deficiency anaemia: compilation of data on the pregnancy outcome. *Amer J of Clin Nutri*. 1994; 59:492-501.
 7. A. Lash and S. M. Coyer, "Anemia in older adults," *Medsurg Nursing*. 2008;17, no. 5, pp. 298–305.
 8. W. P. J. den Elzen, J. M. Willems, R. G. J. Westendorp, A. J. M. De Craen, W. J. J. Assendelft, and J. Gussekloo, "Effect of anemia and comorbidity on functional status and mortality in old age: results from the Leiden 85-plus Study," *Canadian Medical Association Journal*, vol. 181, no. 3-4, pp. 151–157.
 9. Kordas K, Lopez P, Rosado JL, García Vargas G, Alatorre Rico J, Ronquillo D, Cebrián ME, Stoltzfus RJ (2004). Blood lead, anemia, and short stature are independently associated with cognitive performance in Mexican school children. *J. Nutr.*, 134(2): 363-371.
 10. World Health Organization. Obesity: preventing and managing the global epidemic. Report of a WHO Consultation (WHO Technical Report Series 894). Geneva: World Health Organization 2000.
 11. Wormser D, Kaptoge S, Di Angelantonio E et al. Separate and combined associations of body-mass index and abdominal adiposity with cardiovascular disease: collaborative analysis of 58 prospective studies. *Lancet* 2011;377:1085–95.
 12. Vazquez G, Duval S, Jacobs DR Jr et al. Comparison of body mass index, waist circumference, and waist/hip ratio in predicting incident diabetes: a meta-analysis. *Epidemiol Rev* 2007;29:115–28.
 13. Renehan AG, Soerjomataram I, Leitzmann MF. Interpreting the epidemiological evidence linking obesity and cancer: a framework for population-attributable risk estimations in Europe. *Eur J Cancer* 2010;46:2581–92.
 14. Renehan AG, Tyson M, Egger M et al. Body-mass index and incidence of cancer: a systematic review and meta-analysis of prospective observational studies. *Lancet* 2008;371:569–78.
 15. World Health Organization. Global health risks: mortality and burden of disease attributable to selected major risks. 2009.
 16. Dayyal Dg. Cyanmethemoglobin (hemoglobin-cyanide) method for estimation of hemoglobin. *Bioscience*. August 2016;01:05.
 17. Fairbanks VF, Beutler E. Iron deficiency, In; Beutlere E, Lichtman MA. Coller BS. Kipps TJ, eds *Williams Hematology*. 5th edn. New York; Mc Graw-Hill Inc 1995; 490-511.
 18. Lieberman E. Ryan KJ. Monson RR. Schoenbaum SC. *Am J Obstet Gynaecol* 1998; 159: 107-114.
 19. Chitra B, Nisha Nair, Jesni K Jose, Jesina Begam, Nazar Ali, Balakrishna. Study on Prevalence of Anaemia among School Children in a Rural Community Setup. *Sch. Acad. J. Pharm.*, 2014; 3(6): 423-426.
 20. S. Patel, M. Shah, J. Patel, N. Kumar. Iron Deficiency Anemia In Moderate to Severly Anaemic Patients. *Gujarat Medical Journal*, August 2009; 64:2.
 21. Iron deficiency. *Bulletin of the World Health Organization*. 1998; 76(suppl-2):121-123.
 22. Dutta DC. Text book of obstetrics. 3rd edition. New central book agency Calcutta. 1997, p. 270.
 23. World Health Organization. The prevalence of anemia in women: a tabulation of available information. 2nd ed. Geneva WHO.;1992.
 24. Pasricha SR, Black J, Muthayya S, Shet A, Bhat V, Nagaraj S, Shet AS ; Determinants of Anemia Among Young Children in

- Rural India. American Academy of Pediatrics, 2010; 126(1):140-149.
25. Arlappa N, Balakrishna N, Laxmaiah A, Brahmam GNV; Prevalence of anaemia among rural preschool children of Maharashtra, India. Indian Journal of Community Health, 2012; 24 (1):4-8.
 26. Wormser D, Kaptoge S, Di Angelantonio E et al. Separate and combined associations of body-mass index and abdominal adiposity with cardiovascular disease: collaborative analysis of 58 prospective studies. Lancet 2011;377:1085–95.
 27. Vazquez G, Duval S, Jacobs DR Jr et al. Comparison of body mass index, waist circumference, and waist/hip ratio in predicting incident diabetes: a meta-analysis. Epidemiol Rev 2007;29:115–28.
 28. Renehan AG, Tyson M, Egger M et al. Body-mass index and incidence of cancer: a systematic review and meta-analysis of prospective observational studies. Lancet 2008;371:569–78.