Original Research Article

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

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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 below 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 anaemia.

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 <13g/dl in males and an Hb of < 12g/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 anemia 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.

<table>
<thead>
<tr>
<th>Number of patients(n=100)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
</tr>
<tr>
<td>40</td>
<td>40%</td>
<td>60</td>
</tr>
</tbody>
</table>

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

Table.2 Age distribution of patients with anaemia.

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
</tr>
<tr>
<td>16-30</td>
<td>18</td>
<td>45%</td>
</tr>
<tr>
<td>31-45</td>
<td>10</td>
<td>25%</td>
</tr>
<tr>
<td>46-60</td>
<td>12</td>
<td>30%</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Anaemia</th>
<th>Male(n=40)</th>
<th>Female(n=60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
</tr>
<tr>
<td>Mild</td>
<td>18</td>
<td>45%</td>
</tr>
<tr>
<td>Moderate</td>
<td>14</td>
<td>35%</td>
</tr>
<tr>
<td>Severe</td>
<td>8</td>
<td>20%</td>
</tr>
</tbody>
</table>

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.

Table.4. Socioeconomic status of patients with anaemia.

<table>
<thead>
<tr>
<th>Socioeconomic status</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>Percenta ge</td>
<td>Number</td>
</tr>
<tr>
<td>Low</td>
<td>24</td>
<td>60%</td>
</tr>
<tr>
<td>Middle</td>
<td>13</td>
<td>32.5%</td>
</tr>
<tr>
<td>High</td>
<td>2</td>
<td>5%</td>
</tr>
</tbody>
</table>

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.
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.

<table>
<thead>
<tr>
<th>BMI</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Low</td>
<td>22</td>
<td>55%</td>
</tr>
<tr>
<td>Normal</td>
<td>7</td>
<td>17.5%</td>
</tr>
<tr>
<td>High</td>
<td>11</td>
<td>27.5%</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>100%</td>
</tr>
</tbody>
</table>

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 showed 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.\(^{122}\) 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%).\(^{123}\)

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 showed that mild and severe anaemia 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 preschool 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 socio-economic 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 Organiza tion 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). 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 anaemia. 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 anaemia.

**References**


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.