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ANALYSIS OF PREVALENCE, RISK FACTORS AND TREATMENT OF ANAEMIC PATIENTS

Sreedevi R. S.*, Soorya Surendran and Tongbram Nicholas

Department of Pharmacy Practice, Bharathi College of Pharmacy, K. M Doddi, Mandya, Karnataka.

*Corresponding Author: Sreedevi R. S.

Department of Pharmacy Practice, Bharathi College of Pharmacy, K. M Doddi, Mandya, Karnataka.

ABSTRACT

Background: Anaemia is a group of diseases characterized by a decrease in either the hemoglobin (Hb) or the volume of red blood cells (RBCs), which results in decreased oxygen-carrying capacity of the blood. **Objectives:** To analyze the prevalence rate and the drug prescribing pattern of Anaemia. **Study Design:** An analysis of prevalence and drug prescribing pattern in anaemic patients was a prospective observational study conducted in General Medicine Department, MIMS Teaching Hospital and Research Centre, Mandya, Karnataka, by using a well-designed patient data collection form. **Result:** Out of 100 anaemic patients studied, 46.0% were males, 54.0% were females. The majority of anaemia cases were microcytic, suggesting that iron deficiency was the major cause of anaemia. 76% patients are found to be anaemic with co-morbidities while 24% patients are found with anaemia alone. Out of 100 patients 23% patients are untreated. Among treated 77% patients, 50.65% patients receives monotherapy and 49.35% patients receieves combination therapy. Majority of the patients were treated with Folic acid, Ferrous Sulphate + B.Complex and blood transfusion. **Discussion:** Study shows that Prevalence of anaemia was more in females compared to males. Patients prescribed with monotherapy are more than that of combination therapy.

KEYWORDS: Anaemia, prevalence, monotherapy, combination therapy.

INTRODUCTION

Anaemia is defined as a decrease in haemoglobin (or hematocrit) level from an individual's baseline value[1]. It is a condition in which the number of red blood cells (and consequently their oxygen-carrying capacity) is insufficient to meet the body's physiologic needs. Specific physiologic needs vary with a person's age, gender, residential elevation above sea level (altitude), smoking behaviour, and different stages of pregnancy. Iron deficiency is thought to be the most common cause of anaemia globally, but other nutritional deficiencies (including folate, vitamin B12 and vitamin A), acute and chronic inflammation, parasitic infections, and inherited or acquired disorders that affect haemoglobin synthesis, red blood cell production or red blood cell survival, can all cause anaemia.[2] This is a condition characterized by lack of blood or in other word a reduction of total quantity of erythrocyte (red blood cells, RBC) or haemoglobin in the circulation which are necessary for normal function. This is caused by the inability of the bone marrow to replace the erythrocyte lost. The normal level of RBC for the male is 5.4×106 cell/µl and for female is 4.8×106 cell/µl[3]. Individual baseline haemoglobin levels often are not readily accessible, physicians use sex-specific and race-specific reference ranges to make a working diagnosis of anaemia.

Accordingly, the mean red blood cell volume (mean corpuscular volume [MCV]) is used first to classify the anaemic process as microcytic, normocytic, or macrocytic.[1]

This condition is characterized by lower haemoglobin (Hb) level or inadequate circulating RBC or when the amount of iron absorbed each day is lower than the requirement.[3]

According to the World Health Organization (WHO), there are two billion people with anaemia in the world and half of the anaemia is due to iron deficiency. Anaemia is a late indicator of iron deficiency, so it is estimated that the prevalence of iron deficiency is 2.5 times that of anaemia. The estimated prevalence of anaemia in developing countries is 39% in children <5 years, 48% in children 5– 14 years, 42% in women 15–59 years, 30% in men 15–59 years, and 45% in adults >60 years. These staggering figures have important economic and health consequences for low- and middle-income countries. Anaemia and iron deficiency lead to substantial physical productivity losses in adults.

Anaemia is a major health problem in India. The NFHS-3 showed that the prevalence of anaemia was higher in

rural areas; there is a paucity of data about the epidemiology of anaemia in rural settings.[4] The epidemiology of anaemia and aging, in general, is particularly challenging because of increased heterogeneity in the distribution of social and biological risk factors with advancing age. Given that anaemia is a multifactorial condition, the increased co morbidity in older adults makes it difficult to establish whether anaemia is a marker of disease burden or a mediator in the causal pathway leading to adverse events. The World Health Organization (WHO) definition (haemoglobin concentration <12 g/dL in women and <13 g/dL in men) is the most frequently used in epidemiologic studies. Further, older persons with haemoglobin concentration below the WHO cut-offs are generally at increased risk of death, prevalence estimates for WHO-defined anaemia from large, well-characterized community-based studies of older adults. Prevalence of anaemia ranged from 9.2% to 23.9% in men, while in women the range was 8.1–24.7%. First, anaemia is common in community-dwelling older adults and, second, there are large racial differences in the prevalence of WHO defined anaemia.[5]

Anaemia is more common in females, but over age 75 years it is more common in males. Micronutrient deficiencies as cause of anaemia have been repeatedly documented in the elderly. They are thought to be due, among other factors, to lower energy requirements of the elderly which lead to reduced food intake. Suboptimal iron folic acid and vitamin B12 status has been shown to impair cognitive function and immune status.[6]

OBJECTIVES
• To study the prevalence of anaemia.
• To analyse the treatment for anaemia.

MATERIALS AND METHODS
The Ethical Clearance for the study was obtained from the Institutional Ethics Committee, Mandya Institute of Medical Sciences and Research Centre, Mandya, Karnataka. This was a prospective observational study, which was held at MIMS teaching hospital and research center, Mandya, Karnataka, India. MIMS teaching hospital is a 650 bedded hospital, which provide specialized health services to all groups of people in and around Mandy and also to rural people. The essential data for the Prospective study will be collected from the various units of the general medicine department of the MIMS Teaching Hospital and Research Centre using a well-designed patient data collection form.

Inclusion and Exclusion Criteria
Inclusion Criteria
• Both adult male and female patients of age above18 years with anaemia.

Exclusion Criteria
• All pregnant women and children with anaemia who have been admitted to the Mandya district hospital.

• Patients with anaemia and are not willing to give the consent.

Source of Data
The entire patient's data were collected in a well-designed patient data collection form. The data collection form included the patient's demographic data such as name, age, sex, address, date of admission, date of discharge, Inpatient and Outpatient number and the department and unit in which he/she was admitted. It also includes the present complaints of the patient, past medical history, past medication history, family history, social history (includes diet, alcohol/smoking habits, sleep, bowel/bladder, appetite, exercise habit), physical examination, systemic examination, lab investigations done, diagnosis and the treatment given.

Analysis of Results
For the analysis of the results, simple percentage calculations are used to arrive at a conclusion of our study. Microsoft Word and Excel are used to generate graphs and tables where ever required.

RESULTS
A total number of 100 anaemic patients admitted to MIMS teaching hospital were analysed. Out of these 100 anaemic patients, 46 patients were males (46 %) and 54 were females (54%) (Figure1).
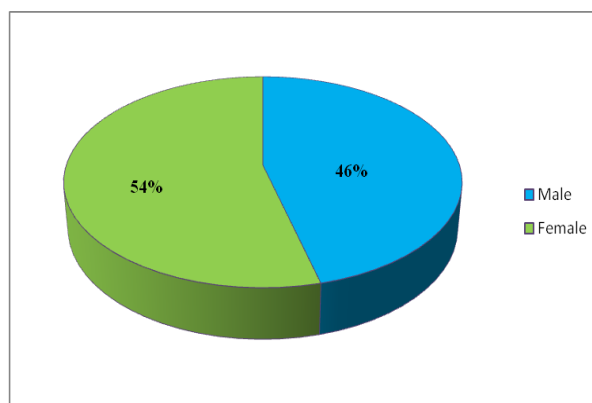

Figure 1: Percentage of male and female anaemic patient's case sheet analysed.

The graphical representation of age and gender wise distribution of patients was depicted below (figure 2).
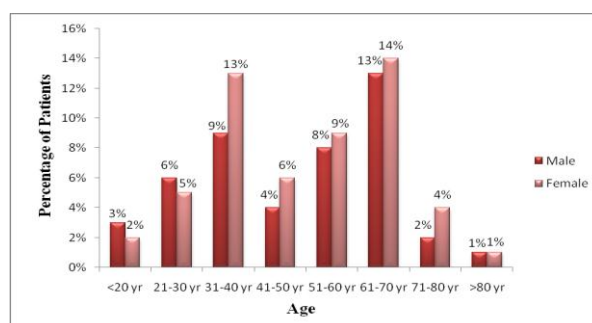

Figure 2: Age and gender wise distribution of patients.

Among 100 cases the physical examination of all patients showed pallor positive. Further the patients were analyzed based on their hemoglobin levels. The hemoglobin values of all the patients were noted and correlated with normal value (Figure 3).
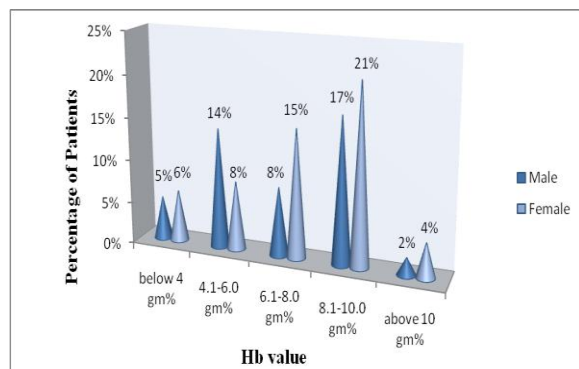

Figure 3: Categorization of patients based on Hb level.

The RBC indices (PCV, MCV, MCH and MCHC) investigations were done for 7 patients (7%) out of 100 patients, among which 6 patients were having abnormal values.

Among 100 study cases 23 patients (23%) were having low Hb level even though they were untreated(figure 4).
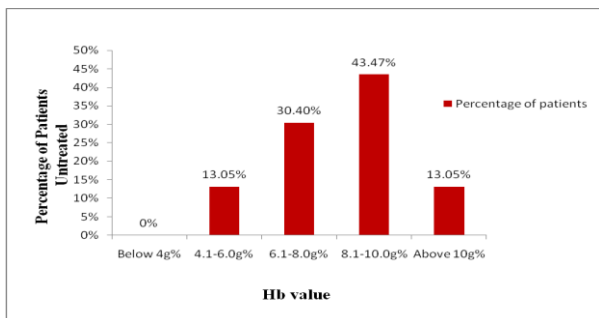
Figure 4: Hb level in untreated patients.

Among the 100 patients, we observed 25 patients with dimorphic anaemia(25%), 30patients with anaemia of unknown origin (30%), 43 patients with nutritional anaemia (43%), 1 patient with normocytic normochromic anaemia (1%) and 1 patient with drug induced anaemia (1%). (figure 5)

Among the 43% of nutritional anaemia, 32 patients (74.42%) were with iron deficiency anaemia(microcytic), 1 patient (2.33%) with folic acid deficiency anaemia (megaloblastic) and 10 patients (23.25%) with undefined nutritional anaemia (figure 6).
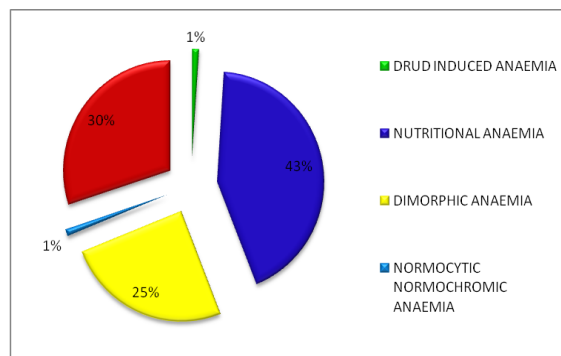

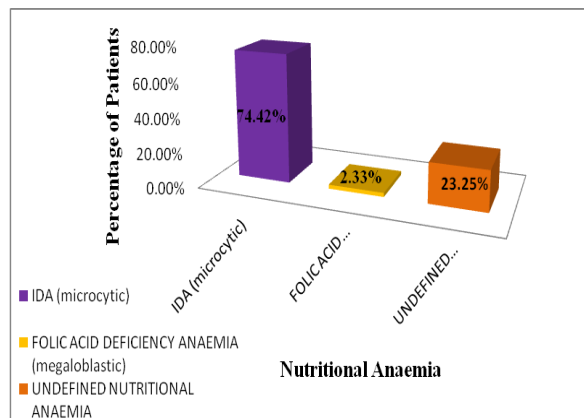**Figure 5: Types of anaemia.**

Figure 6: Nutritional Anaemia.

Out of 100 cases, we found that 24 patients were having only anaemia(24%) among which, 13 are males and 11 are females and 76 patients with co-morbidities (76%), among which 33 are males and 43 are females(figure 7).
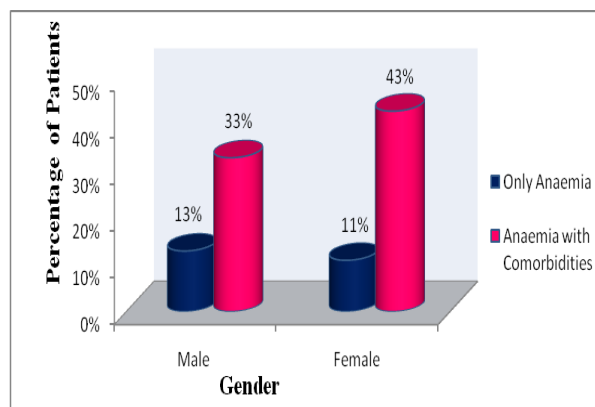

Figure 7: Patient distribution based on anaemia and associated co-morbidities.

Prescribing Pattern of Drugs in Anaemia
The drug prescribing pattern of anemic patients in MIMS teaching hospital includes monotherapy and combination therapy. Among 77 patients (77%) who are treated for anemia, 39 patients (50.65%) receives monotherapy and 38 patients (49.35%) receieves combination therapy. (Figrure 8).

Drug Therapy: Out of 77 treated patients it has been observed that 39 patients (50.65%) received single drug

therapy. Out of that 6 patients (15.38%) are taking ferrous sulphate, 9 patients (23.07%) are taking multivitamin drugs, 4 patients (10.27%) are done with blood transfusion alone, 1 patient(2.56%) is taking Albendazole, 4 patients (10.25%) are taking ferrikind, 10 patients (25.64%) are taking folic acid, 4 patients (10.27%) are taking orofer, 1 patient (2.56%) are taking tonofer. (Figure 9).
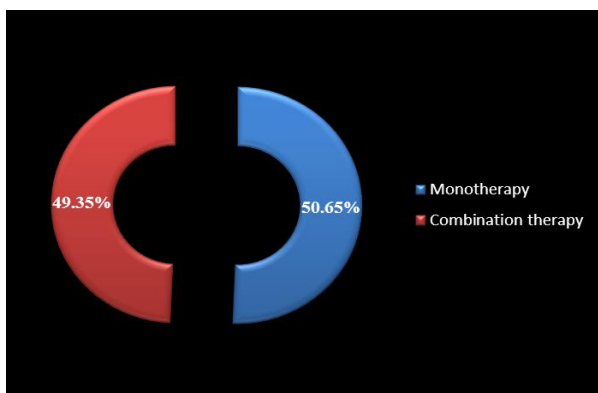

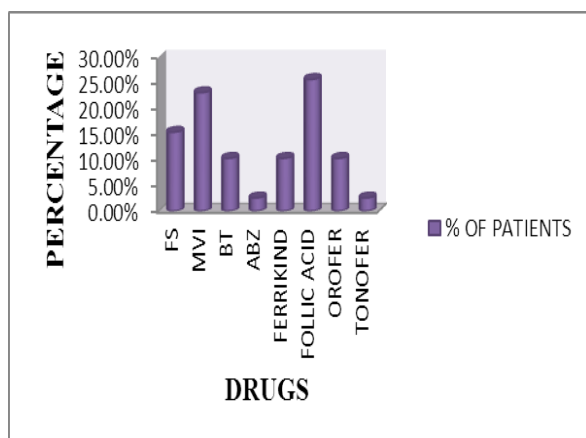**Figure 8: Prescribing Pattern of Anemic Patients.**

Figure 9: Monotherapy In Anemic Patients.

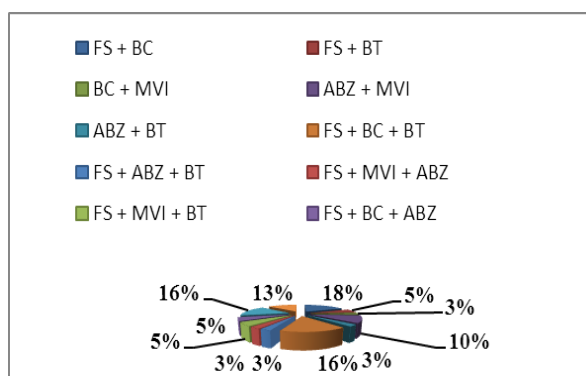**Observed pattern of combination therapy in anaemia is depicted in Figure 10**

Figure 10: Combination Therapy in Anemic Patients.

A total of 27 patients done blood transfusion out of which 4 received only blood transfusion and 23 were prescribed with blood transfusion + other supplements (Table 1).

Table 1: Assessment of Blood Transfusion.

Drug	No. of patients	% of patients
Blood transfusion alone	4	14.82%
Blood transfusion with other drugs	23	85.18%

DISCUSSION
Anaemia is a prevalent disease affecting children, young adults, pregnant women, cancer patients and the elderly. Anaemia has been recognized by the World Health Organization as an important disease leading to significant health care burden.[7] According to the World Health Organization, as many as four to five billion people (66%–80% of the world's population) may be iron deficient, and two billion people (30% of the world's population) are anaemic. Anaemia defined as hemoglobin (Hb) <13 g/dL in men or <12 g/dL in women (as recommended by the World Health Organization).

This is a prospective study conducted among 100 anaemic patients admitted to the general medicine department of MIMS Mandya. Out of these, 46% patients are analysed as males and 54% are females. Out of these patients, 5% falls below 20 yrs of age. 11% within 21-30 years of age, 22% patients within 31-40 years of age, 10% patients within 41-50 years of age, 17% patients within 51-60 years of age, 27% patients within 61-70 years of age, 6% patients within 71-80 years of age, 2% patients are in the age group above 80 years. The RBC indices (PCV, MCV, MCH and MCHC) investigations which is done for 7% of patients, shows that out of them 85.7% of patients are having abnormal values. And out of 100 patients, 23% patients are having low Hb level even though they are untreated.

Based on the types of anaemia, the analysis shows that, 25% of patients are with dimorphic anaemia, 30% of patients are with anaemia of unknown origin, 43% of patients are with nutritional anaemia- among which 74.42% of patients are with iron deficiency anaemia (microcytic); 2.33% patient with folic acid deficiency anaemia (megaloblastic) and 23.25% patients with undefined nurtitional anaemia, 1 patient with normocytic normochromic anaemia (1%) and 1 patient with drug induced anaemia (1%). In the analysis of co-morbidities, 76% patients are analysed, anaemic with comorbidities, and 24% patients are found with anaemia alone.

A total of 77 treated patients it has been observed that 39 patients (50.65%) received single drug therapy. Out of that 6 patients (15.38%) are taking ferrous sulphate, 9 patients (23.07%) are taking multivitamin drugs, 4 patients (10.27%) are done with blood transfusion, 1 patient (2.56%) are taking Albendazole, 4 patients (10.25%) are taking ferrikind, 10 patients (25.64%) are

taking folic acid, 4 patients (10.27%) are taking orofer, 1 patient (2.56%) are taking tonofer.

It has been observed that rest 38 patients (49.35%) received combination drug therapy. Out of that 7 patients (18.42%) are taking FS + BC combination, 2 patients (5.26%) are taking FS + BT combination, 1 patient (2.67%) taking BC + MVI combination, 4 patients (10.52%) taking ABZ + MVI combination, 1 patient (2.63%) are taking ABZ + BT combination, 6 patients (15.79%) is taking FS + BC + BT combination, 1 patient (2.63%) are taking FS + ABZ + BT combination, 1 patient (2.63%) are taking FS + MVI + ABZ combination, 2 patients (5.27%) taking FS + MVI + BT combination, 2 patients (5.27%) taking FS + BC +ABZ combination, 6 patients (15.79%) are taking FS + BC + ABZ + BT combination, 5 patients (13.15%) is taking FS + BC + BT + ABZ + MVI combination.

Out of 77 treated patients, 27 patients (35.06%) were done with blood transfusion. Among these 27 patients, 4 patients (14.82) were done with blood transfusion alone and 23 patients (85.18%) were done with other prescribed drugs.

CONCLUSION
This Prospective study was conducted in General Medicine Department of MIMS Teaching Hospital, Mandya. The highest prevalence of anaemia was seen in female patients 54%. It was found more in the age group of 61-70 years. The drug prescribing pattern of anemic patients includes monotherapy and combination therapy. Combination therapy was found more effective than Monotherapy. We identified that blood transfusion is an effective method for those who are suffering from severe anaemia. Most times Anaemia is presented with co-morbidities, hence anaemia correction is ineffective. In order to get total correction of anaemia, appropriate treatment guidelines for each type of anaemia can be followed.

CONFLICT OF INTEREST
There is no conflict of interest in the study.

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