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PREVALENCE OF ANEMIA AND HEMOGLOBIN LEVELS AMONG GENERAL POPULATION IN SWABI, KHYBER PAKHTUNKHWA

Muhammad Zeeshan[1*], Dr Ikram Ullah[2], Dr Dost Muhammad Khan[3], Dr Ahmad Zeb[4], Dr Nasir Khan[5], Dr Rakhshanda Naheed[6], Dr Jamshed Khan[7]

[1*]MS Biotechnology Department of Biotechnology, University of Swabi, KPK, Pakistan
[2]Dental Surgeon, Assistant Professor, Department of Forensic Medicine, LMCL Loralai Medical College, Loralai, Pakistan
[3]Assistant Professor, Department of Medicine, LMCL Loralai Medical College, Loralai, Pakistan
[4]Professor of Pediatric Surgery, Naseer Teaching Hospital, Peshawar, Pakistan
[5]Lecturer/ MO Internal Medicine, LMC Loralai Medical College, Loralai, Pakistan
[6]Assistant Professor, Department of Physiology, LMCL Loralai Medical College, Loralai, Pakistan
[7]Associate Professor, Anatomy Department, LMCL Loralai Medical College Loralai, Pakistan

***Corresponding Author:** Muhammad Zeeshan
*MS Biotechnology Department of Biotechnology, University of Swabi, KPK, Pakistan
Email: mz335854@gmail.com

ABSTRACT
Anemia is a worldwide health problem, extremely affecting developing countries and causes many serious diseases. Most anemia is asymptomatic or mild, rarely requiring hospitalization. It is multifactorial disease and is not an independent phenomenon. Aging also promotes a rise in anemia in the elderly peoples. According to the World Health Organization (WHO), anemia is defined as hemoglobin (Hb) levels 12.0 g/dL in women and 13.0 g/dL in men. Among collected samples Female anemia was shown to be higher than male anemia. in gender wise assessment, even after taking out the two high-risk categories, pregnant women and very ill individuals. While Frequency of anemia was found high than expected in both gender n=31 (15.5%) male and n=66 (33 %) female in the general population of Swabi which is alarming. The anemia causes different health problems it can cause problems with the heart or lungs, like an atypically rapid heartbeat or even heart failure. So, awareness, education and attention in population specially in females are very essential to conquer this public matter.

Keywords: Prevalence, Anemia, Hemoglobin, Ageing.

INTRODUCTION
Anemia is still a global health issue, particularly in developing nations [1]. It is distinguished by low hemoglobin (Hb) concentrations (<11.0 g/dL), which signify a reduction in the ability of red blood cells (RBC) to meet the body's oxygen demands [2]. Age, sex, and pregnancy are taken into consideration when defining anemia according to the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC). The following is the classification: Anemia is

defined as Hgb level < 11 g/dl in infants aged 6 months to 5 years, < 11.5 g/dl in children aged 5 to 11 years, and < 13 g/dl in adult males; Hgb < 12 g/dl in non-pregnant women and < 11 g/dl in pregnant women[3]. The World Health Organization (WHO) defines anemia as a public health issue when it affects ≥5% of the population. It is considered mild between 5% and 19%, moderate between 20 and
29%, and severe at ≥40% for any group [10] .

At the population level and in clinical practice, Hb concentration is the most prevalent hematological assessment method and indicator used to diagnose anemia [4]. The primary function of hemoglobin (Hb) is to transport oxygen to the tissues, which accounts for the majority of anemia's clinical symptoms, which encompass having pale skin, headache, fatigue, palpitations, dizziness, conjunctival and palmar pallor [5] .

Mostly anemia is asymptomatic or mild, not often requiring hospitalization. Iron-Deficiency Anemia is the most prevalent kind of anemia (IDA) [6] . Anemia from ongoing illness is one of the additional reasons of anemia (most cancers, ulcerative colitis), vitamin A and B12 deficiency, folate (folic acid) deficiency, hereditary defects leading to hemolysis, conditions ensuing in suppression of bone marrow production of red blood cells blood loss etc [7] . Moreover, chronic kidney disease, which impairs the kidneys' capability to provide sufficient erythropoietin, was determined to be one of the main reasons of anemia from the sixth decade of life onwards [25]. It has also been demonstrated that men experienced a higher decline in Hb concentration than women did at lower renal function levels.

[26]. Furthermore, it is thought that the decreased number of bone marrow erythroid progenitors, which is similarly more pronounced in older males than in older women, may be the cause of the diminishing Hb concentration in the elderly [27]. Lower socioeconomic status, lack of health services and food insecurity are the primary reasons of anemia in Pakistan.

Most of the anemia cases are arise due to dietary iron insufficiency. One noteworthy finding is the strong correlation between iron deficiency and a sedentary lifestyle. Obesity is the result of an extended sedentary lifestyle. Weight issues and iron deficiency are common among poor socioeconomic groups that eat inexpensive meals, as has been noted. Such meals have decrease nutrient with high sugar content and preservatives [17]. A recent assessment found that women from low- and middle-income countries frequently struggle with inadequate intake of micronutrients, especially iron, folate, and zinc [28].

Another significant factor that has been identified as having a negative correlation with the likelihood of developing anemia is gender inequality, which also minimizes women's empowerment, limits their access to education, lowers their nutritional literacy, limits household income, promotes early marriage, a high number of pregnancies, and has children during their early years [29].

Iron rich food in sufficient amount is essential for everyday physiological function. Food fortification with iron has been used to prevent anemia in certain countries with varying outcomes relying on sort of food fortified. Food fortification has clearly contributed to a significant increase in the availability of several vital vitamins, such as iron, vitamin A, iodine, and folate [18]. Regular use of fortified staple foods contributes to a consistent supply of nutrients without being hampered by seasonal availability of foods. When commonly consumed goods such as wheat, rice, salt, and maize are fortified, they can
undoubtedly improve the nutritional status of a large population in a simple, effective, and cost-
effective manner. This is referred to as "mass" or "Universal Fortification" [19]. For an example, In places where rice is a staple meal, fortifying rice with iron can be viewed as an effective public health strategy to raise hemoglobin levels [20]. Iron-fortified wheat flour reduced the incidence of anemia by 27%, whether it was combined with or without other micronutrients, according to a comprehensive review of controlled trials [30]. The present study is undertaken to estimate the prevalence and related elements of anemia in widespread population by means of age, gender. The current study will help improve primary care and public health practice related to the diagnosis and management of anemia in general population. Some studies reported a decline of mean hemoglobin

(Hgb) with age in older adults, but others have found no trend with age [12,13].

MATERIALS AND METHODS

2.1 Study site and location

The present study is conducted in Hussain Medical Laboratory from July 2023 to September 2023, situated in the region of Swabi, lies diagonally in between the 34.1201° North latitude and 72.4701°East longitudes. It is located close to the Indus River and 8th largest city of Khyber Pakhtunkhwa. the entire area of district is 91543 square kilometers. Swabi experiences mild winters and humid, warm summers due to its moderate environment. Swabi has an average annual temperature of 22.2 °C and an average yearly precipitation of 639 mm. According to 2017 census, the estimated population of district Swabi is 16,25,477 with urban 275964 and rural 1349513 respectively.

2.2 Collection of Samples

Using venipuncture, 3ml blood is obtained from participants in a sitting position in a sterile syringe and poured in Ethylenediaminetetraacetic acid (EDTA) tube under standard operating techniques. The collected samples are then sent to Hussain Medical Laboratory Topi, Swabi. Informed consent is obtained from participants on the pre-designed proforma at the time of sampling and all the relevant clinical information is recorded while filling the proforma at the time of sampling. The blood is then passed on the complete blood count (CBC) machine or hematology analyzer.

2.3 Inclusion and exclusion criteria:

In current study 273 samples are collected, in which 73 are excluded according to policy. Damaged, leaked, clotted, samples from pregnant and from serious ill people are also excluded. Analyses of anemia prevalence are stratified by gender and age.

RESULTS AND DISCUSSION

3.1 Gender wise distribution of samples:

In the current study, 200 Samples are collected from the participants, among these 94 (47%) are anemic and 106 (53 %) are normal. Anemia is found high in females n=66/200 (33%) than males which is n=31/200 (15.5%) in gender wise estimation. Figure1.

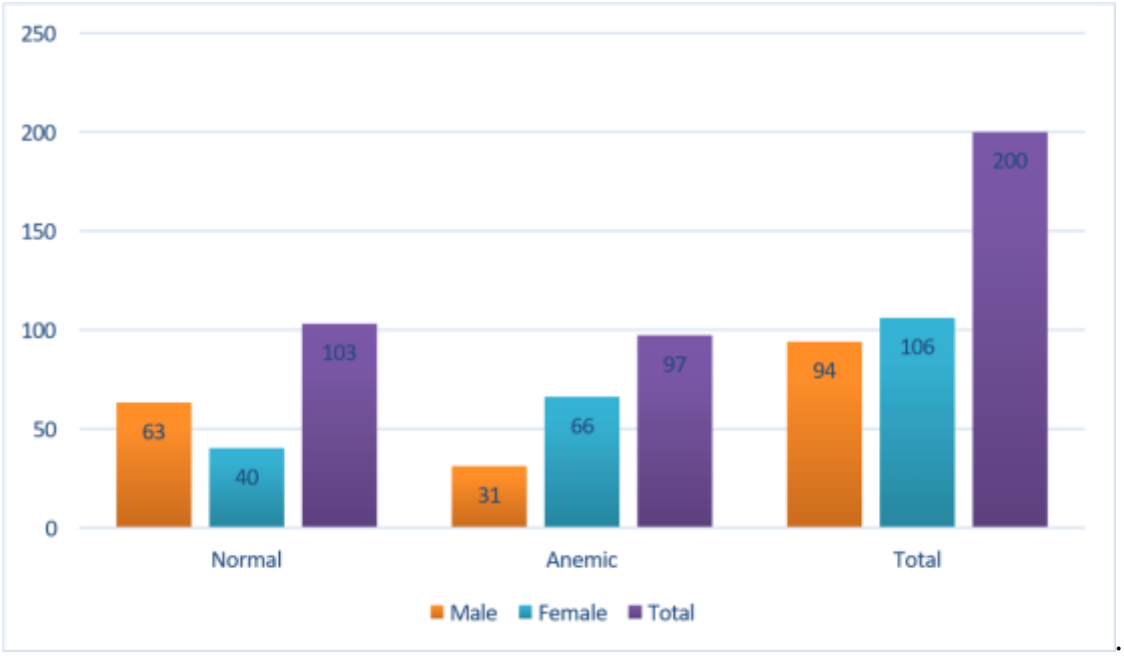

Figure 1: Prevalence of anemia is shown according to gender.

3.2 Age based sample

In age wise distribution 25-35 years are observed more anemic n=38/200 (19%) followed by people of age 15-25 years that is n= 27/200 (13.5%), age 35-45 years is n=17/200 (8.5%) while age 45-55 years are n=15/200 (7.5%) respectively.

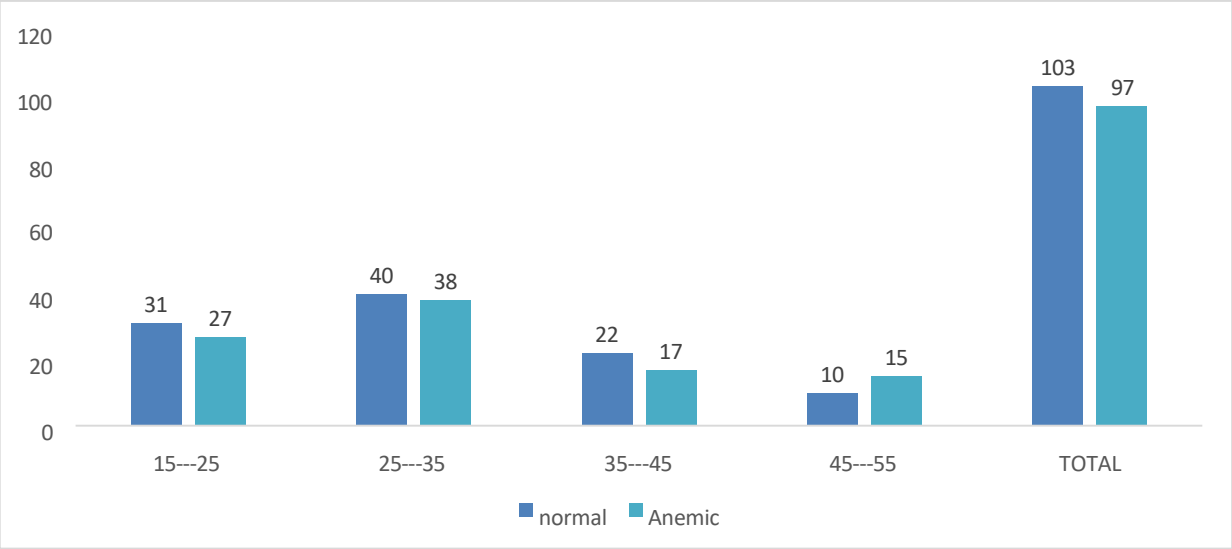

Figure 2 Distribution of hemoglobin values by age

Among these 66/200 anemic females 18 are severe anemic. While in 31/200 anemic males 08 are considered severe anemic. Severe anemia is more common in females. FIGURE 3.

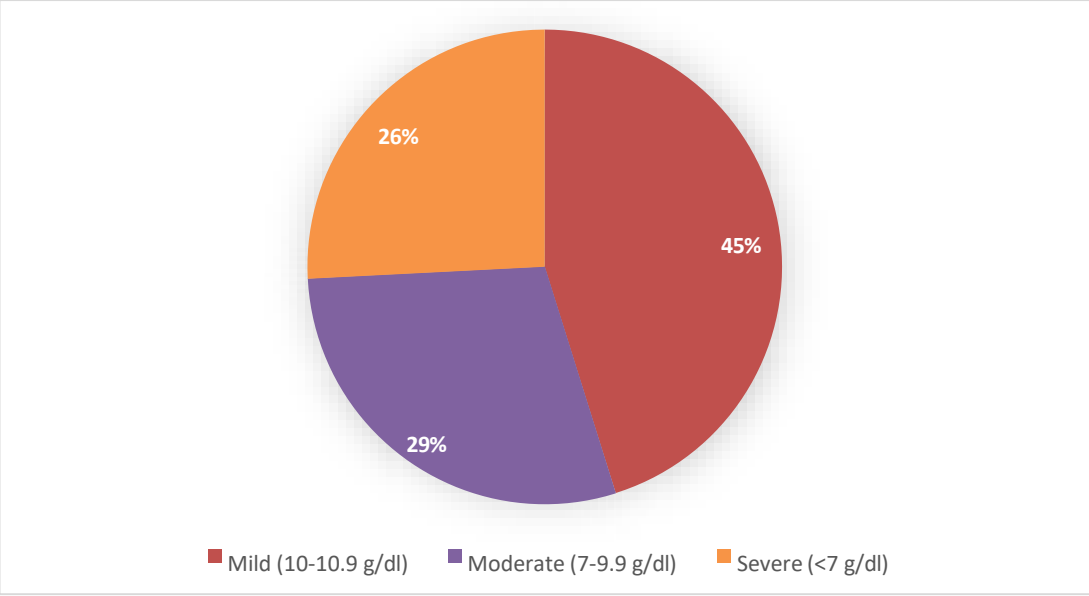

Figure 3: prevalence of the degree of anemia among general population of Dist. Swabi.

DISCUSSION

Anemia is a global health problem which typically have an effect on the population of developing nations. Anemia is broadly dominant in Pakistan like different developing countries. Anemia causes around 20% of maternal mortality, the majority of which occur in underdeveloped countries[16].

Around 40% of the world population is affected by iron deficiency anemia[14]. In 2021, anemia affected almost 2 billion people worldwide, impacting women more than male. According to the National Health Survey of Pakistan (NHSP), the prevalence of anemia among young males in the country as a whole ranges from 12% to 28%, depending on their socioeconomic condition and the

difference between urban and rural areas[15].

According to WHO figures, anemia affects 1.62 billion people worldwide, accounting for 24.8% of the global population (95% CI: 22.9–26.7%)[11]. Global data, however, are unable to accurately reflect the severity of the issue because anemia presents with varied manifestations and causes in various contexts.

According to World Health Organization estimates, 51% of Pakistani non-pregnant women aged 15 to 49 years had blood hemoglobin concentrations of less than 12 g/dl, with an overall mean of 11.7 g/dL. Previous research suggests that iron deficiency is responsible for half of all anemia cases and one million deaths each year worldwide[8,9] .

Resent analysis indicates that the anemia remains the primary health problem in the residents of Swabi, Khyber Pakhtunkhwa, Pakistan. In the current investigation, we found a high prevalence of anemia among the aforementioned populations. In the current investigation, anemia frequency was found to be high in both genders, observed 15.5% in men and 33% in women after with the exception of high risk groups. This study's observation of anemia in the female population at a high frequency (33%), suggests that anemia affects not just pregnant women but also the majority of females in the general population. A study performed by Imran et al and stated 40% anemia within the population of Dir (lower) [21]. Another study by Malik et al reported 80% iron deficiency anemia in Bahawalpur
[22]. According to Tahir et al the anemia frequency was 19.45% in males while 55.56% in opposite gender in General Population of Faisalabad, which strongly supports our results[23]. Khan Et al documented prevalence of anemia 23.9% in women and 1.5% in men among University of Peshawar students [24].

More extensive research involving multiple centers is required to clarify the various age groups that are susceptible to developing anemia, the various risk factors that lead to anemia and how these relate to age, gender, and socioeconomic status in our community. It is also suggested that food fortification with iron be used to reduce anemia, particularly in high-risk individuals. However, large studies are still essential in an effort to confirm these data. The outcomes proven here should prompt us to reflect on the diagnosis of anemia in routine practice and the corrections implemented to it.

CONCLUSIONS AND RECOMMENDATION

The current study concludes that anemia is prevalent in the Swabi population as a whole. The prevalence of anemia is slightly higher and severe in females in comparison to male. Even after with the exception of the high-danger people including pregnant females and severe ill people, this Excessive anemia is concerning, and in order to stop this public health issue, appropriate regulations must be implemented.

ECOMMENDATION

Current study is presenting the primary latest statistics on Hb levels and occurrence of anemia within the population of Swabi. Moreover, in-depth studies conducted in local communities are necessary to accurately assess the prevalence of anemia in our population. Our study is confined to a single region, so these data recommend further research to reach final conclusions that can be implemented to medical practice and awareness in people could be very crucial regarding nutritional deficiencies.

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