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LEVEL OF VITAMIN B12 IN IRON DEFICIENCY ANEMIA STUDY FROM LARKANA, PAKISTAN

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ABSTRACT

Introduction: According to most research, anemia affects 10% to 45% of the elderly. The etiology is often complex and diverse.

Aim: This study aims to evaluate the level of vitamin B12 in iron deficiency anemia in elderly residents of the Larkana region.

Materials and Methods: A total of 280 people were included from which 140 were IDA Patients and 140 were control male and female both were included in this study with a mean age of 26.23 years. Blood Sample was collected for Complete blood count and vitamin B12 level. Only Larkana region participants were included in this study

Results: 50.71% of 280 were reported with low levels of vitamin B12 with confirmed IDA from which 46 (32.85%) females were reported with a low level of vitamin B12 and 25 (17.85) male was reported with a low level of vitamin B12 level who were confirmed IDA Patients. The mean level of B12 in patients was 230.9±46.23 with *a* P-value of 0.003.

Conclusion: Vitamin B12 level was low in iron deficiency anemia patients. It was more reported low level in females as compared to males.

Keywords: iron deficiency anemia; vitamin B12-deficiency anemia

INTRODUCTION

Anemia is a common blood disorder defined by a person's low hemoglobin, low red blood cell count, or both depending on their age, gender, and physical health (1, 2). Anemia in children has a major effect on growth (3). Children with anemia frequently experience cognitive impairment and learning challenges (4). Neurobehavioral development occurs rapidly between six and twenty-four months of age. Children's anemia can have long-term effects, some of which are permanent. (5, 6). Older adults frequently experience anemia. Increasing weakness, low physical activity, decreased cognitive function, an increased risk of dementia, decreased mobility, an increased risk of repeated falls, low skeletal muscle density, decreased bone density, and an increased risk of major depression are all consequences of anemia, regardless of the underlying cause (7). The majority of studies indicate that between 10% and 45% of seniors suffer from anemia. There are several, generally complex reasons (8).

Compared to the general population, older individuals are more susceptible to anemia. This is due to several factors, such as the patient's inability to describe their symptoms in detail, their poor anamnesis from memory loss, their isolation from close friends and family in the majority of cases, the existence of coexisting diseases that can mask the symptoms of anemia, and the widespread false belief that anemia in older people is solely physiological. Anemia is a sign, not a legitimate medical diagnosis (9). Anemia could be a sign of a more serious underlying illness. Erroneous diagnosis and treatment of anemia may lead to poor response to therapy for other linked disorders. Therefore, primary care physicians and other medical professionals should focus on checking for symptoms of geriatric anemia at the time of initial patient contact (10). In the absence of any associated illnesses, anemia should be quickly recognized and treated to maximize the likelihood of beneficial results (11).

2. Materials & Methods

The current study was case-control. The study duration was six months. Population size (N=140 patients and 140 as Control) males and females of Larkana region age range from 18 to 50 years were selected.

Patients were informed about the purpose of the illness and its advantages, and their previous agreement, consent, and willingness to have their blood samples used for this study were acquired.

For the current study, samples were collected from several health sectors in the Larkana region. Two types of samples were obtained for the study: serum for B12 analysis and blood samples from both control and subject groups that were treated with the anticoagulant EDTA for hematology. A 5-milliliter sample of blood was drawn from the veins. To stop blood clotting, the samples were put in a blood CBC container with 0.2% EDTA. These samples were meant to be used for participant analysis, hemoglobin concentration, and cell count. Five milliliters of blood were drawn from each consenting participant and placed in a sterile tube to clot and be tested.

Using MS Excel 2010 and SPSS Version 23, statistical analysis was performed on the reported data. The mean ± standard deviation was used to express the results. The hematological was compared using the student's t-test. For every parameter, a p-value of less than 0.05 was deemed statistically significant.

Results:

Out of a total of 280, 140 was iron deficiency anemia patients while 140 was control group, Mean age was 26.23 years. From 140 IDA group 65 (46%) was male and 75(54%) was female (fig. 1)

Fig 1. Gender Distribution of IDA

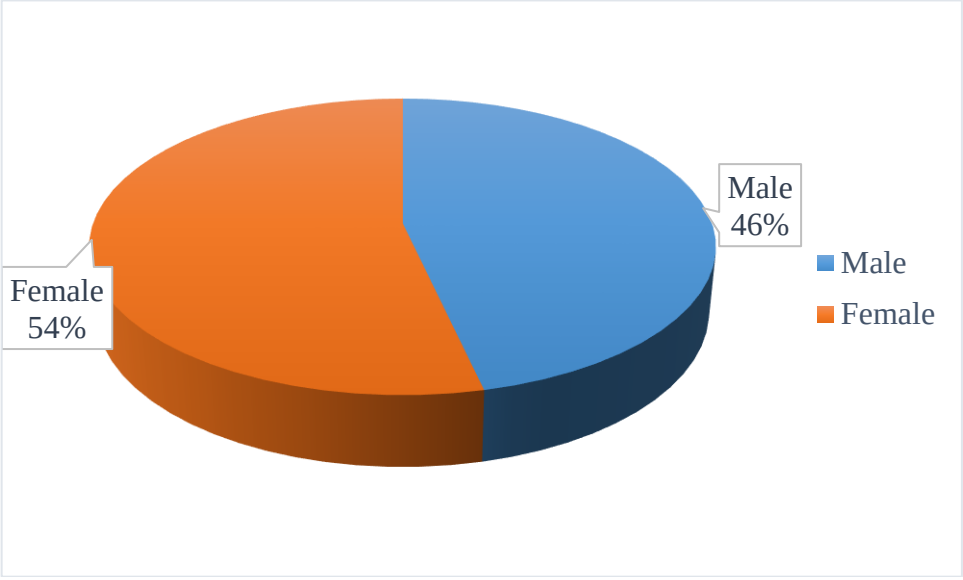

Table 1.0 Show the defciency of vitamin B12 level in IDA patients. From 65 males 25 males was reported with low level of vitamin B12 level while Remain have normal level of vitamin B12 level. 46 Female was reported with low level of vitamin B12 level out of 75 IDA Female patients. 9 (36%) Male was reported in age between 46-50 year of age in male while 24(32%) female also reported at age of 46-50 years' low level of vitamin B12 level. Older have more effected as compare young and female are more reported with low level of vitamin B12 as compare to male.

Age	***Male (N=65)***		***Female(N=75)***	
	Vitamin B12	IDA	Vitamin B12	IDA
18-25 years	2 (8%)	6(9.23%)	9(19.56%)	14(18.66%)
26-35 years	6(24%)	12(18.46%)	8(17.39%)	21(28%)
36-45 Years	8(32%)	25(38.46%)	11(23.91%)	16(21.53%)
46-50 Years	9(36%)	22(33.84%)	18(39.18%)	24(32%)

Tab 1.0 Deficiency of Vitamin B12 level in Iron Deficiency Anemia Male female

Iron deficiency anemia is reported in male with maximum number at age of 36-45 years 25 (38.46%) while 24(32%) female was reported at age of 46-50 years.

Group	**B12** (234-894 pg/ml) Mean±SD	**RBC** (4.4-5.9 10^6/L) Mean±SD	**HB%** (12-16 gm/dl) Mean±SD	**MCV** (76-96FL) Mean±SD	**MCH** (27-32PG) Mean±SD	***P-Value*** *(<0.005)*
IDA N=140	230.9±46.23	3.47±0.413	7.33±1.89	51.4±7.16	19.5±3.56	0.003
Control N=140	354±93.57	5.11±0.246	14.42±0.934	84.1±4.06	29.9±2.46	
p<0.05 (p-value was calculated by t-test).B12=Vitamin B12 RBC= Red blood Cells; HB=hemoglobin; MCV= Mean corpuscular value; MCH= Mean corpuscular hemoglobin.						

Tab 2.0 A Comparative Analysis of Blood Parameters and Vitamin B12 in IDA Patients and Control Individuals

Tab 2.0 show the two group iron defciency anemia and Control Group. Vitamin B12 was reported 230.9±46.23 in IDA patient's RBC level was 3.47±0.413 Hemoglobin was 7.33±1.89, MCV was 51.4±7.16 and MCH was 19.5±3.56 and P-Value was 0.003 and it was significant.

DISCUSSION:

Depending on the society under investigation, anemia prevalence in men can range from 2.9 to 61% and in women from 3.3 to 41% (12). Based on five National Health and Nutrition Examination Surveys conducted every few years from 2003 to 2012, the United Nations found that the prevalence of anemia increased from 4.0% in 2003–2004 to 7.1% in 2011–2012 (13). Furthermore, research has shown that anemia is more common in Blacks than in Whites, with the maximum incidence occurring in all age groups for both sexes (13). In African Americans, the prevalence of anemia is 3.3 times higher than in Whites. Anemia was prevalent in adults over 65 at an incidence of 12%, 40%, and 47% among residents, hospitalized patients, and nursing home residents, respectively, according to a systematic review of 34 studies comprising 85,409 participants (15).

In the complete blood count, the evaluation of anemia depends on Hb, MCV, RBC, RDW, and MCHC levels. Low Hb levels together with lower MCV levels, which is considered microcytic anemia, direct us mostly to iron deficiency anemia, chronic disease anemia, or thalassemia trait. The etiology of macrocytic anemia is most probably vitamin B12 deficiency or folate deficiency (16). However, anemia with normal MCV levels may indicate chronic disease anemia, hypothyroidism, or mixed

anemia (17). A combination of vitamin B12 and iron deficiency is a common finding, especially in developing countries (18). Differential diagnosis of this patient group with normocytic anemia is difficult and needs detailed laboratory examination with elevated cost. Our study focused on changes of reticulocyte parameters between iron deficiency anemia, vitamin B12 deficiency anemia, and mixed anemia.

CONCLUSION:

As far as we are aware, no research has been done on the relationship between iron and vitamin B12 deficiencies. The differential diagnosis of iron deficiency anemia and macrocytic anemia can be made with a straightforward laboratory procedure. Additionally, the differential diagnostic of Iron deficiency anemia and vitamin B12 deficiency can be assessed. Our findings concur with The patient with iron deficiency anemia had low vitamin B12 levels. Compared to men, women reported lower levels of it more frequently. Further research including sizable patient cohorts is required to assess the correlation between iron deficient anemia diagnosis and vitamin B12.

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