ORIGINAL ARTICLE

VITAMIN B12 DEFICIENCY AMONG PATIENTS WITH MEGALOBLASTIC ANEMIA

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ABSTRACT

Objective: To determine the frequency of vitamin B12 deficiency in different age group of patients with megaloblastic anemia.

Material & Methods: It is descriptive cross-sectional study in which 84 patients with megaloblastic anemia were selected at department of pathology Khyber Teaching Hospital Peshawar-Pakistan from January 2018 to June 2018. Patients were divided in different age of groups. Complete blood count and serum B12 levels were measured.

Results: Among 84 patients, 54 (64.3%) were male while 30 (35.7%) were female. The mean age of participants of study was 41.9 years (SD ±19.7) with age range from 1 to 85 years. There were 50 (60%) patients with vitamin B12 deficiency. Among patients with vitamin B12 deficiency 32 (64%) were male while 18 (36%) were female. Regarding various age groups, similar number of patients i.e. 16, reported in each of age group 31 to 45 years and more than 45 years. In age group 16 to 30 years, 14 patients had vitamin B12 deficiency.

Conclusion: Vitamin B12 deficiency is common, irrespective of gender and age groups in megaloblastic anemia patients.

Key Words. Vitamin B12, megaloblastic, anaemia, deficiency.

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INTRODUCTION

Vitamin B12 deficiency is quite common and wide spread condition. In US and UK around 6% of people have B12 deficiency and this rise to around 20% in those over the age of 60 years[1]. In parts of Africa, it is 70% and in some parts of India it is 70 to 80%[1]. In Pakistan, the vitamin B12 deficiency ranges from 10% to 52% as reported by different researchers[2-4]. This extended range is probably due to regional, ethnic and socio-economic factors. In a case control study conducted in Pakistan, 3.2% of healthy control subjects were having B12 deficiency [5].

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In general population, the main causes of Vitamin B12 deficiency are pernicious anemia and gastritis leading to malabsorption of Vitamin B12 [6-8]. In United States, for women and men over age 18 years, the adequate intake is set at 4.0ug/day[9]. Vitamin B12 is only produced in nature by certain bacteria and archaea[10]. It is synthesized by some bacteria in the gut flora in humans but humans cannot absorb it, as it is made in the colon[11]. For humans the bioavailability from eggs is less than 9% compared to 40-60% from meat[12]. It also functions as a coenzyme meaning that its presence is required for enzyme catalyzed reactions[13]. Vitamin B12 deficiency usually presents with various hematological, gastrointestinal and neuropsychiatric manifestations. Commonly neuropsychiatric manifestations include myelopathy and neuropathy [14]. B12 deficiencies have been known to cause megaloblastic anemia. An anemia which is characterized by the presence of abnormally large erythrocyte precursor cells, megaloblasts, in the

bone marrow and macrocytic red cells in the peripheral blood[15]. Megaloblastic anemia is frequently seen in clinical practice in Pakistan[16,17].

The aim of this study is to determine the frequency of vitamin B12 deficiency in different age groups of patients with megaloblastic anemia.

MATERIAL AND METHOD

It was a descriptive cross sectional study conducted at Department of Pathology, Khyber Teaching Hospital, Peshawar from January 2018 to June 2018. After taking informed consent, a sample of 84 patients with prior diagnosis of megaloblastic anemia were selected through non probability convenient sampling technique. The patients with co-morbidities like diabetes mellitus, hypertension, ischemic heart disease, hepatitis, critical illness and patients receiving cynocobalmins (Vitamin B12) were excluded. The serum cobalamin levels of <200pg/ml on two separate occasions were considered as Vit B12 deficiency. The patients were divided in different age groups i.e. less than 16 years, 16 to 30 years, 31 to 45 years and more that 45 years. The data collected was recorded on purposefully designed proforma and analyzed via SPSS version 21.

RESULTS

A total of 84 patients with megaloblastic anemia were analyzed for vitamin B12 levels. Among 84 patients, 54 (64.3%) were male while 30 (35.7%) were female. The mean age of participants of study was 41.9 years (SD ±19.7) with age range from 1 to 85 years. There were 50 (60%) patients with vitamin B12 deficiency (Figure 01). Among patients with vitamin B12 deficiency 32 (64%) were male while 18 (36%) were female (Table 01). Regarding various age groups, similar number of patients i.e. 16, reported in each of age group 31 to 45 years and more than 45 years (Table 02). In age group 16 to 30 years, 14 patients had vitamin B12 deficiency (Table 02).

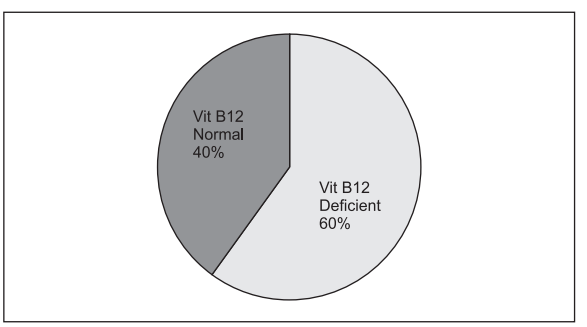

Fig 1: Frequency of Vitamin B12 Deficient Patients

Table 1: Gender distribution of Meglablastic Anemia Patients with Vitamin B12 Levels

Gender	Vitamin B12 Levels		Total
	<200pg	>200pg	
Male	32 (38.1%)	22 (26.2%)	54 (64.3%)
Female	18 (21.4%)	12 (14.3%)	30 (35.7%)

Table 2: Age Groups of Megaloblastic Anemia Patients with Vitamin B12 Levels

Gender	Vitamin B12 Levels		Total
	<200pg	>200pg	
<15 years	4 (4.8%)	2 (2.4%)	6 (7.1%)
16 to 30 years	14 (16.7%)	6 (7.1%)	20 (23.8%)
31 to 45 years	16 (19%)	10 (11.9%)	26 (31%)
>45 years	16 (19%)	16 (19%)	32 (38.1%)

DISCUSSION

The aim of this study was to determine the frequency of vitamin B12 deficiency in different age group of patients with megaloblastic anemia. The common manifestation of vitamin B12 deficiency is megaloblastic anemia. Vitamin B12 is mandatory dietary factor and is required by DNA synthesis. Hematopoietic cells are affected by vitamin B12 deficiency and may results into megaloblastic anemia [18]. In our study the 60 % of the patients with megalobastic anemia had vitamin B12 deficiency. This finding is almost close to the percentages reported by Hashim H and Iqbal SP i.e is 76% and 78.5% respectively[17, 19].

In our setting, different causes are attributed to the deficiency of vitamin B12. These include dietary insufficiency and parasitic infestations[20, 21]. It is evident by several studies that Vitamin B12 malabsorption is linked with development of megalobastic anemia. Beside this, the deficiency of vitamin B12 is probably associated with increased risk of cardiovascular diseases especially in diabetic patients[22]. The present study shows that among megaloblastic anemia patients 50 (60%) were male and 34 (40%) were female. Iqbal SP detected similar findings in their study i.e. 56% in male and 44% in female[19].

In this study most of the patients with vitamin B12 deficiency were related to older age groups of 31 to 45 and more than 45 years i.e. 32% each. Ahmad T found almost identical observation in his study i.e. 82% in age group more than 32 years (23)[19]. The frequency of vita-

min B12 deficiency in megaloblastic anemia is reported in populations belonging to diverse geographical and ethnic groups of Pakistan. These populations were related to urban and rural areas as well as northern, central and eastern geographical regions of Pakistan[19, 24]. These findings in different age groups and gender are consistent with our study.

Recent research suggested an association between vitamin B12 deficiency with disorders related to cardiovascular and nervous system even in case of absence of megaloblastic anemia. This may pose a risk for irreversible health conditions. Therefore, an early screening for vitamin B12 deficiency is highly recommended. It's a single centre study with limited number of patients. In order to have a substantial inferences related to above objective, a larger center study with more patients is suggested.

CONCLUSION

Vitamin B12 deficiency is common, irrespective of gender and age groups.

RECOMMEDATIONS

An early screening for vitamin B12 should be considered even in case of presence of non specific sign and symptoms of anaemia.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

Rahman S: Conceptualization, Data Collection, Manuscript writing.

Sharif N: Data Analysis, Manuscript writing, Proof Reading.

Rahman S: Review of manuscript.

Suleman S: Manuscript Review.

Gul A: Sample Collection.

Abbas M: Data collection.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.