THE PREVALENCE OF VITAMIN B12 DEFICIENCY IN PREGNANT WOMEN IN AL-JALAA HOSPITAL, TRIPOLI, LIBYA

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ABSTRACT

Objective: The aim of the study was to investigate the incident of vitamin B12 deficiency in pregnant women.

Method and material: It was a prospective study conducted at Al-Jalaa hospital, Tripoli, Libya. A total of 40 pregnant women who visited the outpatient department voluntarily participated. The study was conducted between 25 January 2010 and 5 February 2010.

Results: The result of the study indicated that the incidence of Vitamin B12 deficiency in pregnant women in Libya is as high as 40%.

Conclusions: The study was conclusive enough to indicate that a high percentage of vitamin B12 deficiency is present which needs proper readdressal and remedy.

1. INTRODUCTION

Vitamin B12 belongs to a group of vitamins of the B- complex series. It is a cobalt containing compound so known as cobalamins. It is involved in the synthesis of myelin sheath, DNA, protein and fatty acid degradation (1, 2). The natural source of vitamin B12 is food obtained from animals (example like liver, kidney, egg, fish and milk) (3). Apart from these, microorganisms are able to produce vitamin B12 (4). The major cause of vitamin B12 deficiency is low dietary intake of food containing vitamin B12 (5). The deficiency of vitamin B12 causes macrocytic megablastic anemia and neurological disorders (4).

Megaloblastic anemia is due to severe deficiency of vitamin B12 and is also associated with pernicious anemia (6).

Effect on foetus to vitamin B12 deficiency during pregnancy

The deficiency of vitamin B12 causes adverse effects on the foetus (7). There has been a strong association between intrauterine growths of foetus and status of vitamin B12 in the body of pregnant women (8, 9). Its deficiency also leads to neuropathy such as sub-acute combined degeneration of the spinal cord. In 20–30% of cases neurological manifestation occur with anemia.

Prepregnancy deficiency of vitamin B12 causes infertility or recurrent spontaneous abortion (10).

Diagnosis of vitamin B12

Diagnosis of vitamin B12 is done in blood serum/plasma by estimating the level of vitamin B12 and if the concentration falls below <191 pg/ml, indicates as low concentration or deficiency. A gold standard indicator is elevated serum methylmalonic acid (MMA) but its use is limited owing to high cost of MMA indicator (11, 12). The current assay technique face same limitations as sub minimal level does not indicates vitamin B12 and vice versa deficiency.

Individuals with significant vitamin B12 deficiency almost always have elevated levels of total homocysteine and methylmalonic acid in plasma (13, 14). Inversely measurement of plasma levels homocysteine and methylmalonic acid can be used to confirm the vitamin B12 deficiency (14

–16). Thus, individuals with low or borderline levels of vitamin B12 and elevated levels of homocysteine or methylmalonic acid can be defined as having biologically significant' vitamin B12 deficiency (17).

1.2. Objective

The purpose of this study was to find out the prevalence of Vitamin B12 deficiency in pregnant ladies

2. MATERIAL AND METHOD

2.1 Study design

This was a prospective study. A total of 40 pregnant women participated in the study. They were in investigated and followed up at Al-Jalaa Hospital outpatient department between the period of 25 January 2010 and 5 February 2010.

2.2.1. Requirements for blood collection

1. Disposable plastic syringe and disposable needle 5 ml syringe and 23 G needle is used for blood collection.
2. Vacutainer.
3. Tourniquet.
4. 70 % Isopropyl alcohol.
5. Sterile gauze.
6. Rack for holding specimen upright.
7. A puncture-resistant disposable container.

8. Rubber gloves.
9. Closed system `ABBOTT (MEIA)AXSYM.

2.2. Collection and handling of the blood

A total of 40 random venous blood samples collected in vacutainers for biochemical tests. The blood sample were allowed to clot at room temperature. Then the clots were loosened gently from the container wall. The tubes were centrifuged for 5 min at 3000rpm and the supernatant was pipetted into another tubes and stored at -20 °C until further analysis in the Central Hospital of Tripoli. Vitamin B12 concentrations were determined by closed system `ABBOTT (MEIA)AXSYM

2.3. Statistical analysis

Data analysis was performed in Excel 2007 software using computer. The prevalence data for vitamin B_{12} deficiency were presented as percentage.

3. RESULTS

The Range for the serum vitamin B12 levels was (191 - 663) pg/ml. Vitamin B12 deficiency were prevalent in 16 women, and 24 women were normal as given in (Table 1 & Figure 1).

TABLE 1. NUMBER OF PREGNANT WOMEN IN RELATION TO VITAMIN B12 DEFICIENCY

	Vitamin B_{12} deficiency	Normal	Total
Number	16	24	40
Percentage	40 %	60 %	100%

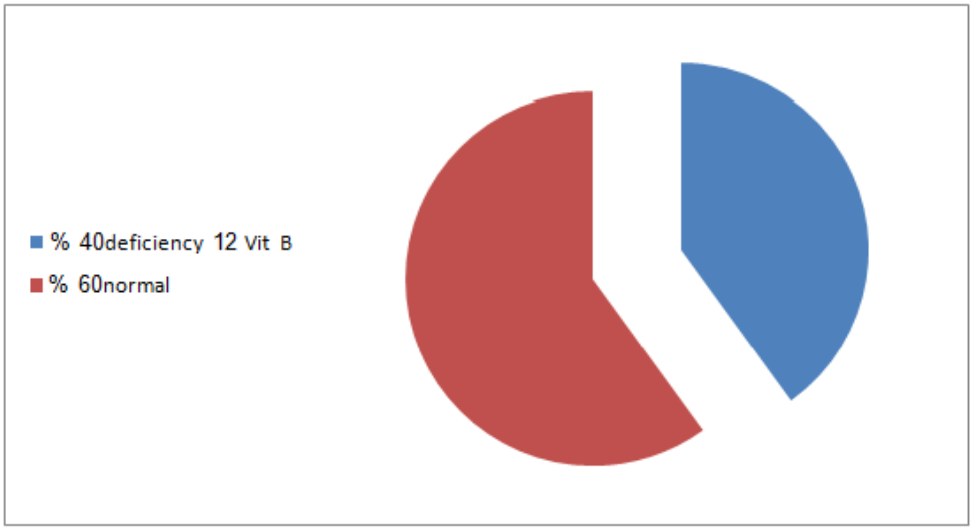

Figure 1. Prevalence of Vitamin B_{12} deficiency

3.1. Effect of age

A total of 40 pregnant women were investigated in Tripoli, Libya. Their range for the age was 22y - 42 y, (Mean 32 y) as given in Table 2.

TABLE 2. **THE PREVALENCE OF VITAMIN B12 DEFICIENCY IN PREGNANT WOMEN ACCORDING TO AGE**

S. No	Age	Number of Volunteers	Vitamin B_{12} deficiency	Normal
Group I	20 – 29	23	34.7%	65.3%
Group II	30 – 39	13	31%	69%
Group III	>40	4	25%	75%

3.2. Scheme according to the gestational parity

Table 3 showed the occurrence of vitamin B12 deficiency according to gestational period.

TABLE 3. EFFECT OF PARITY ON VITAMIN B12

Parity	Number	Vitamin B_{12} deficiency	Normal
Primary gravid	10	20 %	80 %
P I	6	16.6 %	83.4%
P II	11	54.5 %	45.5 %
P III	7	42.9 %	57.1 %
P IV	6	20 %	80 %

3.3. Scheme according to the gestational age

Two women were in the first trimester of pregnancy (range: 8 - 13 weeks), four women in the second trimester (range: 14 - 26 weeks), and 34 women in their last trimester (27 - 40 weeks) as grouped in Table 3. The incidence of vitamin B12 deficiency in relation to period of gestation has been shown in Table 3.

TABLE 4. THE PREVALENCE OF VITAMIN B12 DEFICIENCY IN RELATION TO THE GESTATIONAL AGE

Stage of Pregnancy	Vitamin B_{12} deficiency	Normal
First trimester	0 %	100 %
Second trimester	25%	75 %
Third trimester	32.4 %	67.6%

4. DISCUSSION

The deficiency of vitamin B12 is a vital health issue worldwide. Although the prevalence of vitamin B12 deficiency showed high variability. Presently the vitamin B12 level less than 191pg/ mL is considered as deficiency.

In this study the prevalence of vitamin B12 deficiency was found to be 40%. This rate is lower than the outcome of similar study conducted in Haryana state, India where the rate was high 74.1% (18).

The main reason for the deficiency of vitamin B12 during prevalence can be correlated to inadequate or insufficient dietary intake of B12 vitamin.

There was no significant effect of age or parity on vitamin B12. Lastly the status of vitamin B12 deficiency on gestational age showed maximum deficiency during third trimester (32.4%) followed by second trimester (24%) and first trimester (0%).

5. CONCLUSION

This study concluded that the prevalence of vitamin B12 deficiency is highest in third trimester pregnancy. However there is no effect of age or parity on vitamin B12 levels. Further it can be concluded that increasing the intake of food containing vitamin B12 or vitamin B12 supplements can reduce the incidence during third trimester of pregnancy.

6. RECOMMENDATIONS

It is recommended to further evaluate the rate of vitamin B12 in other cities of Libya. Larger group of pregnant population should be survey and method of estimation should be accurate. Every pregnant women should be encouraged to attend clinic periodically.

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