

# Vitamin B12 Deficiency among Palestinians: A Critique Study

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## **Background and Objectives:**

Vitamin B12, in the form of a cofactor, plays an important role in some key reactions involved in DNA synthesis. Deficiency of this vitamin results in defective DNA synthesis leading to megaloblastic anemia. Patients with Vit B12 deficiency usually show unique hematologic and/or neurologic abnormalities. Neurologic manifestations in the absence of hematologic abnormalities have been reported in many cases. Early diagnosis and proper treatment are crucial to avoid the damaging sequel of megaloblastic anemia which sometimes is irreversible. During the last several years, it was noticed in Palestine that serum vitamin B12 determination was more frequently requested by the physicians and vitamin B12 deficiency becomes as if it is an epidemic disease. In this study and to elucidate this phenomenon, I have analyzed the results of serum vitamin B12 for 1620 individuals.

## **Methods:**

The results of 1620 individuals were obtained from three different clinical laboratories in Ramallah which are using different methods for the determination of vitamin B12. The results were organized in a grouped frequency table and analyzed taking into consideration the reference range of vitamin B12 for each method.

## **Results:**

81% of the individuals were **females** of young age!! The CBC profile was normal for 95% of patients!! An isolated abnormal result of Vit B12 was used as the sole criterion on which treatment decision was based. No repeat assay or additional confirmatory tests were requested to confirm the diagnosis such as serum folate, red cell folate, serum homocystein, and urine Methylmalonic Acid (MMA). It was found that 25% of the results were abnormal if the cut-off value was 200 pg/mL. If it was 300, 35% were abnormal but if it was 400 pg/mL there were 50% abnormal.

## **Conclusion:**

In fact, it takes several years for a person to develop vitamin B12 deficiency as a result of malabsorption because the daily requirement of vitamin B12 is low (around 3 mg) and the storage rate is high (around 5 mg). Also, it is well known that the methods used to determine Vit B12 do lack specificity (50%) and sensitivity (95%). Based on the available data, 25%-50% of the time there were low levels of vitamin B12. As low levels of vitamin B12 without vitamin B12 deficiency have been reported, are all the individuals in the study with low levels of vitamin B12 truly having vitamin B12 deficiency? Conversely, some individuals with normal levels of Vit B12 do have megaloblastic anemia. As each method of assay has its own drawbacks (CV is around 11% and they lack sensitivity and specificity), and vitamin B12 deficiency may be identified in the absence of the expected clinical and hematologic findings and **visa versa**, a careful and intelligent interpretation of results is very essential. To confirm low or suspected results of vitamin B12, it is recommended to test also for serum and red cell folate, serum homocystein, and urine MMA.

An isolated result of serum B12 should not be the sole criterion on which treatment decision is based, and a repeat assay and other confirmatory and clinical evaluation are necessary prior to a diagnostic conclusion. Additional secondary testing with metabolite levels and monitoring of treatment response is recommended.

Accordingly, I think that the high incidence of Vit B12 deficiency among Palestinians is fake because of misinterpretation.