

AMPATHCHAT

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The diagnosis of Vitamin B12 deficiency revisited



Introduction

Vitamin B12 deficiency can lead to devastating disabilities, morbidity and even death if not diagnosed timeously. Prompt diagnosis and treatment of Vitamin B12 deficiency can easily reverse the wide range of debilitating neurological and hematological symptoms associated with Vitamin B12 deficiency.

Vitamin B12 deficiency, as a cause of neuropsychiatric and hematological disabilities, is well recognised, but the diagnosis can still pose difficulties. In this publication, we would like to review the possible risk factors, clinical manifestations, different biomarkers and their limitations. We would also like to propose an algorithm for the diagnosis of Vitamin B12 deficiency.

Risk factors for developing Vitamin B12 deficiency

Risk factors for developing Vitamin B12 deficiency include gastrointestinal disorders, typically bacterial or parasitic infections and the autoimmune condition of pernicious anemia, chronic medication use such as proton pump inhibitors, histamine H2 receptor antagonists and metformin, vegetarianism, alcoholism and adults older than 75 years of age.

Manifestations of Vitamin B12 deficiency

Vitamin B12 deficiency can have many symptoms, which vary from mild to non-specific, haematological and/or devastating neurological impairment.

Table 1: Manifestations of Vitamin B12 deficiency

Manifestations of Vitamin B12 deficiency	
Non-specific	Glossitis Skin hyperpigmentation Infertility Fever
Hematological	Cytopenias Fatigue Exertion Cardiovascular symptoms
Neurological	Memory loss Depression Alzheimer's disease Psychiatric disorders and psychosis

Biomarkers for Vitamin B12 status and their limitations

Vitamin B12 deficiency causes notable changes in other laboratory parameters, such as an increase in lactate dehydrogenase, increased bilirubin and a decrease in haptoglobin. Specific biomarkers of Vitamin B12 status include serum Vitamin B12, homocysteine and methyl malonic acid assays.

Table 2: Biomarkers for Vitamin B12 deficiency

Biomarkers for Vitamin B12 deficiency	Limitations
Supporting parameters	Macrocytic anemia on full blood count Increased lactate dehydrogenase – often over 1 000 U/l Low haptoglobin
Specific parameters for Vitamin B12	Serum Vitamin B12 levels Homocysteine Methyl malonic acid
	Serum Vitamin B12 lacks standardised reference ranges Homocysteine lacks specificity Methyl malonic acid is expensive, lacks specificity and is not readily available.

Proposed algorithm for diagnosing Vitamin B12 deficiency

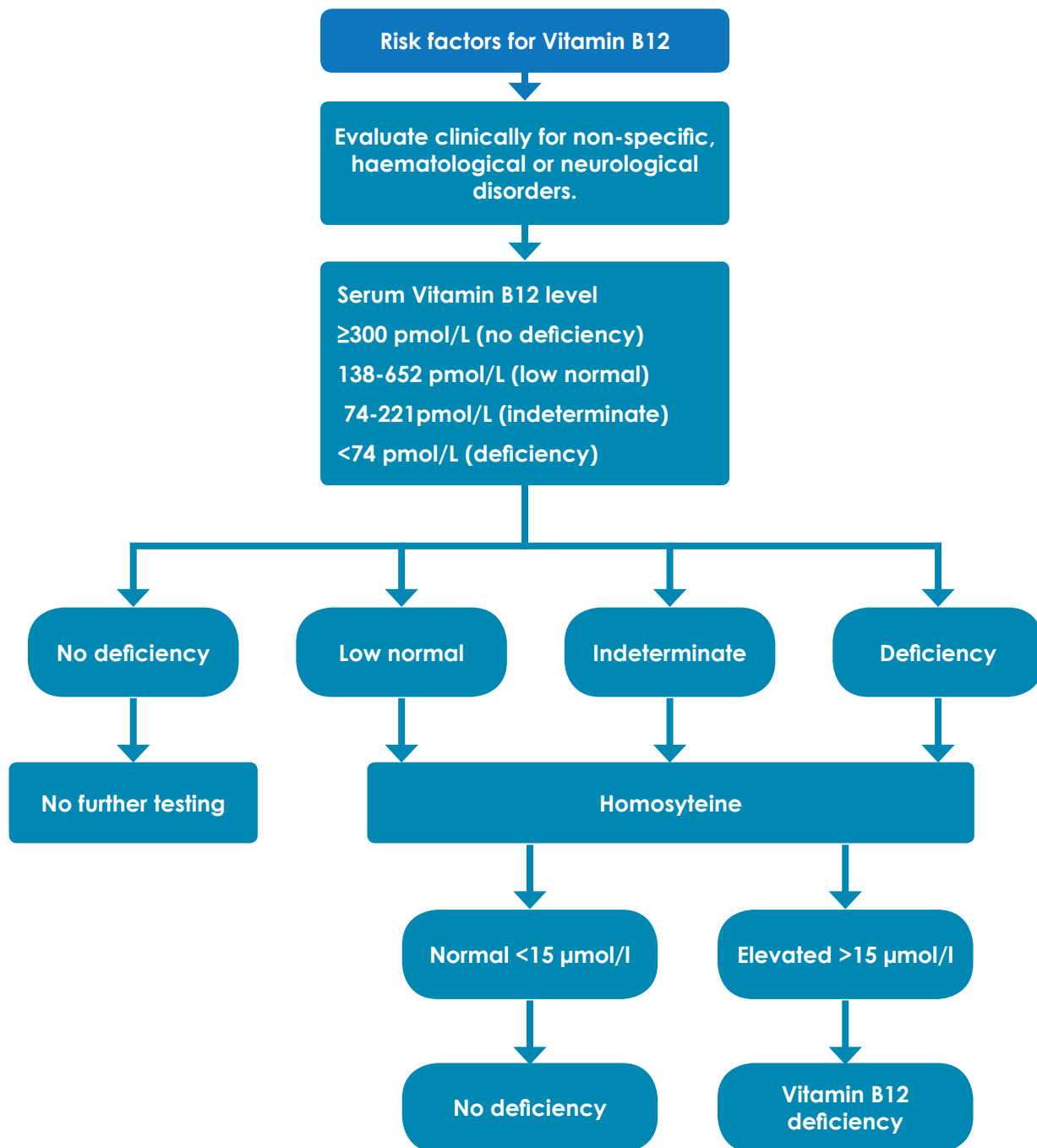


Figure 1: Suggested approach to diagnose Vitamin B12 deficiency

References available upon request.