

Managing Metformin Use and Vitamin B12 Deficiency

Nayana Muhammad*

Department of Public Health, Somalia National University, Mogadishu, Somalia

Perspective

Received: 26-Feb-2024, Manuscript No. JCMCS-24-131015; **Editor assigned:** 29-Feb-2024, PreQC No. JCMCS-24-131015(PQ); **Reviewed:** 13-Mar-2024, QC No. JCMCS-24-131015; **Revised:** 20-Mar-2024, Manuscript No. JCMCS-24-131015(R); **Published:** 27-Mar-2024, DOI: 10.4172/J Clin Med Case Stud.9.1.006.

***For Correspondence:** Nayana Muhammad, Department of Public Health, Somalia National University, Mogadishu, Somalia

E-mail: nm1289@gmail.com

Citation: Muhammad N. Managing Metformin Use and Vitamin B12 Deficiency. J Clin Med Case Stud. 2024;9:006

Copyright: © 2024 Muhammad N. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

DESCRIPTION

In diabetes management, Metformin stands as the most prescribed drug, offering effective control over blood sugar levels and reducing the risk of complications. However, beneath its apparent efficacy lies a potential side effect, Vitamin B12 deficiency. This article explores the complexities of balancing the benefits of Metformin with the risks of B12 deficiency, and offering strategies for navigating this challenge effectively.

The importance of metformin

Metformin, a biguanide derivative, has been the first-line therapy for type 2 diabetes for decades. Its mechanism of action involves reducing hepatic glucose production, enhancing peripheral insulin sensitivity, and decreasing intestinal glucose absorption. These actions contribute to improved glycemic control, making Metformin a cornerstone in diabetes management guidelines worldwide. Moreover, its affordability and relatively low risk of hypoglycemia further solidify its position as a go-to medication for millions of individuals with diabetes.

Vitamin B12

Vitamin B12, also known as cobalamin, plays a crucial role in various physiological processes, including DNA synthesis, red blood cell formation, and neurological function. Its deficiency can lead to a spectrum of clinical manifestations, ranging from mild fatigue and weakness to severe neurological complications such as neuropathy and cognitive impairment. While Vitamin B12 is primarily obtained from animal-derived foods, its absorption in the body depends on intrinsic factor-mediated uptake in the ileum.

Metformin and vitamin B12 absorption

Despite its benefits, long-term Metformin use has been associated with decreased levels of Vitamin B12. This association stems from Metformin's interference with calcium-dependent membrane actions in the ileum, where vitamin B12 absorption primarily occurs. Specifically, Metformin has been shown to disrupt the enterohepatic

circulation of B12 and impair the conversion of dietary B12 to its active form, methylcobalamin. Consequently, individuals on prolonged Metformin therapy are at an increased risk of developing Vitamin B12 deficiency over time.

Balancing benefits and risks

The problem of managing Metformin use and Vitamin B12 deficiency lies in balance between optimizing glycemic control and minimizing the risk of adverse effects. On one hand, Metformin remains the gold standard for diabetes treatment, offering proven benefits in reducing cardiovascular events and mortality rates. On the other hand, the potential for B12 deficiency cannot be ignored, given its implications for long-term health outcomes.

Mitigating strategies to overcome vitamin B12 deficiency

Several strategies can be implemented to overcome vitamin B12 deficiency

Healthcare awareness: Healthcare providers should be vigilant in educating patients about the risk of Vitamin B12 deficiency associated with Metformin use. Routine screening for B12 levels and monitoring for clinical symptoms should be integrated into diabetes management protocols, particularly for individuals on long-term therapy.

Individualized approach: Supplementation strategies should be adopted to each patient's needs based on B12 levels, dietary intake, and clinical symptoms. While routine supplementation may be warranted in some cases, it's essential to avoid excessive dosing, which can lead to unnecessary costs and potential adverse effects.

Exploration of alternatives: For patients at high risk of B12 deficiency or those who develop intolerance to Metformin, exploring alternative therapies or adjunctive treatments is crucial. Sodium-glucose cotransporter-2 (SGLT-2) inhibitors, for instance, offer glycemic control without the same risk of B12 depletion and may be considered as viable alternatives in certain cases.

Ongoing research: Continued research into the mechanisms underlying Metformin-induced B12 deficiency and potential mitigating strategies is essential. This includes investigating the role of dietary interventions, pharmacological agents, or novel drug formulations that could minimize B12 depletion while preserving the therapeutic benefits of Metformin.

CONCLUSION

The association between Metformin use and Vitamin B12 deficiency underscores the need for a detailed approach in diabetes management. By raising awareness, individualizing care, and exploring alternative strategies, healthcare professionals can optimize patient outcomes and ensure the safe and effective use of Metformin in the ever-evolving landscape of diabetes care. Balancing the benefits of Metformin with the risks of B12 deficiency requires a multifaceted approach that prioritizes patient well-being and underscores the importance of personalized medicine in diabetes management.