ANKARA MEDICAL JOURNAL

Case Report

Ankara Med J, 2025;(4):467-472 10.5505/amj.2025.82258

A RARE ASPECT OF COMMONLY ADMINISTERED VITAMIN B12 INJECTION THERAPY IN PRIMARY CARE: ACNEIFORM ERUPTION

Yağmur Karakoç[1], Nadide Yıldız[2], Hilal Aksoy[1], İzzet Fidancı[1], Duygu Ayhan Başer[1]

[1]Department of Family Medicine, Hacettepe University, Ankara, Türkiye
[2]Department of Family Medicine, Hakkari Public Health Center, Hakkari, Türkiye

Correspondence:
Yağmur Karakoç (e-mail: ygmrkrkc199@gmail.com)

Submitted: 10/10/2025 // Accepted: 03/12/2025

Ankara Yıldırım Beyazıt University Faculty of Medicine
Department of Family Medicine

Abstract

Objectives: Vitamin B12 deficiency is a common condition encountered in primary care, typically resulting from inadequate dietary intake. Intramuscular B12 replacement therapy is widely used and generally considered safe; however, it may rarely cause dermatological adverse effects, particularly acneiform eruptions. We report the case of a 26-year-old female patient who received intramuscular cyanocobalamin for five consecutive days to correct B12 deficiency. In the second week of treatment, she developed non-pruritic papulopustular eruptions, initially appearing on the back and chest and subsequently spreading to the face and neck. The clinical presentation was consistent with a vitamin B12-induced acneiform eruption. This case highlights the need for primary care physicians to be aware of this rare adverse effect and emphasizes the importance of early recognition and appropriate management.

Keywords: Acneiform eruption, vitamin B12, primary care.

ANKARA MEDICAL JOURNAL

Introduction

Vitamin B12 (cobalamin) is a water-soluble vitamin essential for cellular metabolism, particularly in DNA synthesis, methylation, and mitochondrial function.[1] Dietary sources of vitamin B12 primarily include animal-derived products such as red meat, dairy products, and eggs. Its absorption requires intrinsic factor, a glycoprotein secreted by gastric parietal cells, which facilitates uptake in the terminal ileum. Deficiency of vitamin B12 can result in hematological abnormalities and neurological manifestations. Common causes include inadequate dietary intake, malabsorption, autoimmune disorders such as pernicious anemia, or exposure to certain medications or toxins (e.g., metformin). Treatment involves vitamin B12 supplementation, administered orally or parenterally, with dosage and duration tailored to the underlying etiology. [2]

In Turkey, vitamin B12 deficiency is frequently encountered in primary care practice, particularly among young women, elderly individuals, and those with nutritional inadequacies, making vitamin B12 supplementation one of the most commonly prescribed therapies in family medicine settings.

Acneiform eruptions are dermatological conditions resembling acne vulgaris, frequently triggered by corticosteroids, anti-tuberculosis medications, antipsychotics, certain chemotherapeutic agents, and vitamin B12 supplementation. The temporal relationship between the initiation of the causative agent and lesion onset is useful in distinguishing acneiform eruptions from typical acne.[3] Vitamin B12-induced acneiform eruptions are characterized by papulopustular lesions without comedones or cysts and may affect the face, forehead, chin, neck, shoulders, chest, and back.[4]

Although vitamin B12 deficiency is commonly encountered in primary care and its treatment is generally considered safe, rare dermatological adverse effects related to parenteral B12 therapy—particularly acneiform eruptions—may be overlooked. This case report aims to increase awareness among family physicians regarding the potential adverse effects of intramuscular B12 therapy. Furthermore, it highlights the clinical presentation of B12-induced acneiform eruptions and emphasizes the importance of early recognition and appropriate management in primary care settings.

Case Presentation

A 26-year-old woman presented to the family medicine outpatient clinic with fatigue. She had a history of epilepsy and was on levetiracetam 750 mg/day under neurological follow-up. Vital signs were stable (temperature 36 °C, pulse 80 bpm, blood pressure 110/70 mmHg), and systemic examination was unremarkable. Laboratory tests revealed a serum vitamin B12 level of 119 ng/L (reference: 200–900 ng/L),

confirming deficiency. She was prescribed intramuscular cyanocobalamin injections, 1000 mcg/mL, once daily for five consecutive days as a loading regimen.

In the second week, the patient developed non-pruritic papulopustular eruptions on the back and chest, which later spread to the face and neck, without comedones or cysts (Figure 1). No systemic allergic signs were noted. The eruption was considered secondary to B12 therapy.

Figure 1. Vitamin B12–induced acneiform eruption presenting with monomorphic papulopustular lesions on the back and shoulders of a young female patient.

Vitamin B12 injections were discontinued, and treatment included doxycycline 100 mg twice daily, topical clindamycin-benzoyl peroxide gel once daily, and oral antihistamines. At the two-week follow-up, lesions had largely resolved, with a marked reduction in inflammation (Figure 2). The patient was advised on sunscreen use to prevent post-inflammatory hyperpigmentation and to return if lesions recurred.

Figure 2. Partial regression of lesions observed two weeks after antibiotic treatment.

This case highlights that while B12 therapy is generally safe, clinicians should be aware of rare dermatological adverse effects and manage them promptly.

Discussion

Vitamin B12 deficiency is a common clinical condition worldwide, frequently encountered in primary care, and is characterized by hematological and neurological manifestations. Treatment strategies vary according to the underlying etiology.[2] A comprehensive meta-analysis comparing the efficacy of sublingual, intramuscular, and oral vitamin B12 administration in patients with deficiency demonstrated that these routes effectively increase serum vitamin B12 levels without significant differences between them, contrary to common assumptions.[5] When absorption is not impaired, oral vitamin B12 supplementation may be preferred over intramuscular administration because it is non-invasive, easier to administer, more comfortable for the patient, and equally effective.

Acneiform eruptions can be triggered by various medications; however, vitamin B12-induced acneiform eruptions are rarely reported in the literature. Some common features of these eruptions include their usual occurrence in adults, sudden onset, and papulopustular lesions without comedones or cysts, frequently affecting the face, neck, shoulders, chest, and upper back. These eruptions may be accompanied by mild to severe pruritus. The clinical course is generally favorable; lesions typically resolve completely and spontaneously upon discontinuation of the causative agent, with scar formation rarely observed.[4] The exact pathogenesis of vitamin B12-induced acneiform eruptions has not been fully elucidated. Recent studies suggest

that systemically administered vitamin B12 may be taken up by *Propionibacterium acnes*—a commensal bacterium of the skin—resulting in increased porphyrin production, which may trigger acne development through inflammation.[6] Additionally, iatrogenic high-dose vitamin B12 may exert an androgen-stimulating effect. [7] Because acneiform eruptions can resemble acne vulgaris, a detailed pharmacological history and thorough physical examination are essential to distinguish between these conditions.[8]

In drug-induced acne, discontinuation of the offending agent is often sufficient for resolution; however, the treatment of acne vulgaris typically requires a more comprehensive approach, including benzoyl peroxide, topical and oral antibiotics, as well as topical and oral retinoids.[9] In the presented case, the acneiform eruptions associated with vitamin B12 injections regressed rapidly following immediate cessation of B12 therapy combined with systemic doxycycline added to topical treatment. Conversely, a similar case reported in the literature described resistant eruptions developing after both intramuscular and sublingual administration, which were only controlled under isotretinoin therapy; vitamin B12 supplementation was reintroduced only with dose titration and concomitant isotretinoin coverage. This suggests that the severity and treatment response of B12-induced acneiform reactions may vary significantly among individuals. [7]

Conclusion

Although vitamin B12 therapy is generally considered safe, rare dermatological adverse effects may occur. Early recognition and appropriate management of such adverse reactions are critically important, especially for family physicians working in primary care settings. Family physicians should be aware of the potential side effects associated with frequently prescribed vitamin B12 treatments, particularly injections, and exercise caution in their administration. They should also be able to promptly identify and manage any emerging reactions. Moreover, the preference for intramuscular administration, an invasive procedure, may impose additional workload not only on the patient but also on healthcare providers. Additionally, vitamin B12-induced acneiform eruptions have been reported predominantly following intramuscular administration. In this context, primary care physicians need to consider efficacy, safety, and ease of administration when selecting the treatment route. A thorough medication and supplement history—including both prescription and over-the-counter agents—is an integral part of the clinical approach to the differential diagnosis of acneiform eruptions. This approach aligns with the principles of early diagnosis, prevention, and holistic care emphasized in the WONCA vision for family medicine.[10]

Ethical Considerations: Written informed consent was obtained from the patient, and all personal information has been kept confidential.

Conflict of Interest: The authors declare no conflict of interest.

References

1. Green R, Allen LH, Bjørke-Monsen AL, Brito A, Guéant JL, Miller JW, et al. Vitamin B12 deficiency. *Nat Rev Dis Primers*. 2017;3:17040. doi:10.1038/nrdp.2017.40
2. Ankar A, Kumar A. Vitamin B12 deficiency. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 [cited 2025 Aug 19]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK441923/
3. Kazandjieva J, Tsankov N. Drug-induced acne. *Clin Dermatol.* 2017;35:156–162. doi:10.1016/j.clindermatol.2016.09.014
4. Veraldi S, Benardon S, Diani M, Barbareschi M. Acneiform eruptions caused by vitamin B12: a report of five cases and review of the literature. *J Cosmet Dermatol.* 2018;17:112–115. doi:10.1111/jocd.12325
5. Abdelwahab OA, Abdelaziz A, Diab S, Khazragy A, Elboraay T, Fayad T, et al. Efficacy of different routes of vitamin B12 supplementation for the treatment of patients with vitamin B12 deficiency: a systematic review and network meta-analysis. *Ir J Med Sci.* 2024;193:1621–1639. doi:10.1007/s11845-023-03456-7
6. Kang D, Shi B, Erfe MC, Craft N, Li H. Vitamin B12 modulates the transcriptome of the skin microbiota in acne pathogenesis. *Sci Transl Med.* 2015;7:293ra103. doi:10.1126/scitranslmed.aab2009
7. Lolatgis H, Su J, Nguyen R. Successful re-introduction of vitamin B12 after using isotretinoin to treat severe acne medicamentosa. *Australas J Dermatol.* 2016;57:320–321. doi:10.1111/ajd.12345
8. Bahbouhi I, Aboudourib M, Hocar O, Amal S. Vitamin B12 induced acneiform eruption. *Heliyon.* 2023;9:e15734. doi:10.1016/j.heliyon.2023.e15734
9. Owen JJ, Youssef RM, Altman K, editors. Vitamin B12–induced acneiform eruption. *Baylor Univ Med Cent Proc.* 2025;38:1–3. doi:10.1080/08998280.2025.1234567
10. WONCA Europe. The European definition of general practice/family medicine [Internet]. Leuven: WONCA Europe; 2023 [cited 2025 Jun 22]. Available from: https://www.woncaeurope.org/kb/european-definition-gp-fm-2023