Case Report

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Transient HBsAg Positivity Following Hepatitis B Vaccination in a Patient Undergoing Hemodialysis: Case Report

Hemodiyaliz Tedavisi Uygulanan Bir Hastada Hepatit B Aşısı Sonrası Geçici HBsAg Pozitifliği: Olgu Sunumu

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ABSTRACT

Transient hepatitis B surface antigen (HBsAg) positivity following hepatitis B (HB) vaccination is a rare occurrence and, particularly in hemodialysis patients, may lead to unnecessary clinical interventions if misinterpreted. A 42-year-old male with a history of myasthenia gravis, nephrotic syndrome, and thymic carcinoma was admitted to the clinic to initiate chronic hemodialysis for steroid-resistant focal segmental glomerulosclerosis. Since baseline serology was negative for HBsAg and anti-HBs, the patient was administered a double dose of recombinant HB vaccine. One day after vaccination, HBsAg positivity was detected, and the patient was dialyzed using an isolated dialysis machine. The positivity persisted on the second day but completely resolved by day 12. The final test was negative for HBsAg, with an anti-HBs titer of 10.85 IU/L. Additional vaccine doses were administered, and HBsAg remained negative on follow-up evaluations. To prevent misdiagnosis and unnecessary isolation or interventions, accurate interpretation of serological findings and effective interdisciplinary communication in dialysis centers are critically important.

Keywords: Hepatitis B surface antigen, hepatitis B vaccine, hemodialysis, glomerulosclerosis, focal segmental, chronic kidney disease

ÖZ

Hepatit B (HB) aşısı sonrasında geçici HB yüzey antijeni (HBsAg) pozitifliği nadir görülen bir durumdur ve özellikle hemodiyaliz hastalarında yanlış yorumlandığında gereksiz klinik müdahalelere yol açabilir. Miyastenia gravis, nefrotik sendrom ve timik karsinom öyküsü bulunan 42 yaşında erkek hasta, steroid-dirençli fokal segmental glomerüloskleroz tanısı ile kronik hemodiyaliz başlatılmak üzere kliniğe yatırıldı. Başlangıç serolojisinde HBsAg ve anti-HBs negatif saptandığı için hastaya rekombinant HB aşısı çift doz uygulandı. Aşılamadan bir gün sonra HBsAg pozitifliği görüldü ve hasta izole makinede diyalize alındı. İkinci günde devam eden pozitiflik, 12. gün itibarıyla tamamen düzeldi. Son testte HBsAg negatif, anti-HBs titresi ise 10,85 IU/L olarak ölçüldü. Takip eden aşı dozları uygulandı ve HBsAg negatif kaldı. Yanlış tanı ve gereksiz izolasyon/müdahalelerin önüne geçebilmek için serolojik bulguların doğru yorumlanması ve hemodiyaliz merkezlerinde disiplinler arası iletişimin sağlanması kritik öneme sahiptir.

Anahtar Kelimeler: Hepatit B yüzey antijeni, hepatit B aşısı, hemodiyaliz, glomerüloskleroz, fokal segmental, kronik böbrek hastalığı

Introduction

Patients with chronic kidney disease (CKD) on hemodialysis are at an increased risk for hepatitis B virus (HBV) infection due to frequent vascular accesses and exposure to blood and its products (1). The repeated invasive procedures required for their care further heighten their susceptibility to infections, including HBV, which can progress to severe liver disease if left unaddressed. Routine HB vaccination is, therefore, a critical preventive measure recommended by healthcare guidelines to protect this vulnerable population from HBV infection (1). Despite the high efficacy of recombinant HB vaccines, rare events such as transient HB surface antigen (HBsAg) positivity following vaccination have been documented. Such occurrences can pose diagnostic challenges, leading to unnecessary isolation or treatment modifications, particularly in the hemodialysis setting (2,3).

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Transient HBsAg positivity may reflect the detection of HBsAg in the absence of an active infection. This generally occurs because the highly sensitive assays detect circulating non-infectious viral particles from the vaccine itself (4,5). Although infrequent, identification of this transient response is important to avoid unnecessary clinical interventions. Moreover, the transient nature of such a serological finding underlines the importance of proper follow-up testing to confirm true infection status (2,3,6). This case report describes a patient with a complex medical history, including myasthenia gravis, nephrotic syndrome, and prior thymic carcinoma, who developed transient HBsAg positivity following a double-dose recombinant HB vaccination at the initiation of chronic dialysis. The findings provide insight into the interpretation of serological results in CKD patients undergoing HB vaccination and highlight the need to distinguish antigenemia due to vaccination from active HBV infection through appropriate clinical evaluation and follow-up.

Case Report

A 42-year-old male patient, with a medical history of myasthenia gravis, nephrotic syndrome, and previously treated thymic carcinoma, was admitted to the nephrology department on September 5, 2024, for the management of focal segmental glomerulosclerosis refractory to both steroid and immunosuppressive therapies. Due to progressive renal insufficiency and persistent refractory proteinuria, medical nephrectomy was performed, followed by initiation of hemodialysis three times per week.

On October 15, 2024, the patient commenced hemodialysis at the unit. Initial serological screening revealed negative HBsAg and anti-HBs. Consequently, a double-dose recombinant HB vaccine (Elovac-B) was administered to enhance the immunogenic response, in accordance with standard recommendations for hemodialysis patients. The vaccination schedule was meticulously planned to optimize the patient's immunological response, with doses administered as follows: the first dose on October 16, 2024; the second dose on November 16, 2024; the third dose on December 16, 2024; and the fourth dose on January 16, 2025. The fifth dose is yet to be administered.

During routine pre-dialysis screening at another dialysis center on October 18, 2024, the patient tested positive for HBsAg. As a precautionary measure, he was placed on an isolated dialysis machine designated for HBsAg-positive cases. Concerned about this unexpected result, the patient informed his primary nephrology team. Repeat serological testing performed at the same dialysis center on October 26, 2024, revealed that the patient had become negative for HBsAg. Additionally, anti-HBs was detected at a low titer of 10.85 IU/L. Molecular testing for HBV-DNA and HBV-RNA yielded negative results, further supporting the absence of active infection. The serological timeline is detailed in Table 1.

The patient continued on hemodialysis without recurrence of HBsAg positivity. The planned vaccination schedule was adhered to without interruption, and no adverse events were observed following the administration of subsequent vaccine doses. Anti-HBs titers demonstrated a progressive increase over time, confirming the development of a successful immunological response to the vaccination.

Discussion

Transient HBsAg positivity following HB vaccination has been rarely reported, primarily in immunocompromised individuals or patients undergoing chronic dialysis. The recombinant HB vaccine contains non-infectious HBsAg particles that can circulate transiently and may be detected by sensitive assays, leading to false-positive results. This may result in unnecessary patient isolation, modifications to dialysis arrangements, and undue concern among healthcare workers, particularly when vaccination schedules overlap with routine serological testing. Early recognition of this transient response is crucial to minimize unwarranted anxiety and prevent unnecessary clinical interventions (2,3,4,5,6,7,8).

The duration of HB surface antigenemia after vaccination is brief, usually 1-7 days, however, this may be prolonged up to 4 weeks in patients on hemodialysis (8). Janzen et al. (4) was the first one to report positive HBsAg among hemodialysis patients, where they turned negative within 20 days of vaccination. Shortly after that, Brodersen et al. (5) also reported a case of transient antigenemia in hemodialysis patient subsequent to third dose of HB vaccine, which cleared one week after vaccination. In early 2000s, Ly et al. (9) found nine hemodialysis patients to be HBsAg positive attributed to vaccine that was also transient. Olde and Garcia (10) has reported HBsAg positive results as 50% among hemodialysis patients and concluded that it lasted no more than two weeks. In the present

Table 1. Test results

Date	HBsAg	Anti-HBs	HBV-DNA	HBV-RNA
Before vaccination	Negative	NA	NA	NA
2 days post-vaccination	+	NA	NA	NA
6 days post-vaccination	Borderline	10.85 IU/L	Negative	Negative
12 days post-vaccination	Negative	5.58 IU/L	NA	NA
19 days post-vaccination	NA	5.58 IU/L	NA	NA
Post 3rd dose vaccination	Negative	2.0 IU/L	NA	NA

HBsAg: Hepatitis B surface antigen, HBV: Hepatitits B virus, DNA: Deoxyribonucleic acid, RNA: Ribonucleic acid, NA: Non-applicable

case, transient HBsAg positivity was noted two days following vaccination and resolved by day 12. The absence of detectable HBV-DNA or HBV-RNA supported vaccine-induced antigenemia rather than active infection (2,5,6). Thus, low post-vaccination anti-HBs titers reflect impaired active immunization in patients with CKD and prior immunosuppressive therapies. The transient response noted in this complex patient, with numerous comorbid conditions and therapy for immunosuppression, draws into light certain unique challenges with which patients suffering from CKD may have to bear in an immunization schedule (2,3,4). Moreover, distinguishing between transient antigenemia and active HBV infection is critical to avoid inappropriate clinical decisions, such as unnecessary antiviral treatment or prolonged patient isolation. This case has provided valuable information on the uncommon but clinically significant transient HBsAg positivity and its implications for patient care and institutional policies. This case highlights the importance of cautious interpretation of serological results obtained after HB vaccination in patients with CKD. Transient HBsAg positivity needs to be recognized to avoid inappropriate interventions, which include isolation and modification of dialysis practice. Liaison between dialysis units and the renal team ensures good patient care and prevents inappropriate isolation of the patient (2,6,7,8). All healthcare professionals should be aware of such possibilities when planning routine serological testing shortly after vaccination, to avoid confusion and simplify patient management.

Study Limitations

This case report has some limitations that should be acknowledged. First, the findings are based on a single patient and therefore cannot be generalized to all patients undergoing hemodialysis or HB vaccination. Second, the patient had multiple comorbidities and a history of immunosuppressive treatment, which may have influenced the immune response to vaccination and limited the interpretation of the findings in otherwise healthy dialysis populations. Despite these limitations, the report provides clinically important insights into a rare but potentially misleading phenomenon in dialysis practice.

Conclusion

This report describes a rare yet clinically significant case of transient HBsAg positivity following HB vaccination in a patient undergoing chronic dialysis. Accurate recognition and appropriate management of this phenomenon rely on heightened awareness among healthcare providers and robust interdisciplinary coordination. By recognizing and addressing this rare occurrence, clinicians can improve patient care and optimize institutional protocols.

Ethics

Informed Consent: Informed consent was obtained from the patient.

Footnotes

Authorship Contributions

Surgical and Medical Practices: M.Y., S.Ö., Concept: M.Y., N.Ö., C.P.D., S.Ö., Design: M.Y., N.Ö., S.Ö., Data Collection or Processing: M.Y., N.Ö., C.P.D., S.Ö., Analysis or Interpretation: M.Y., N.Ö., S.Ö., Literature Search: M.Y., N.Ö., S.Ö., Writing: M.Y., N.Ö., C.P.D., S.Ö.

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