



Tenofovir Alafenamide in Chronic Hepatitis B: Real-World Outcomes

Kronik Hepatit B'de Tenofovir Alafenamid: Gerçek Yaşam Sonuçları

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ABSTRACT

Objectives: Long-term viral suppression with nucleos(t)ide analogues is the cornerstone for preventing disease progression in chronic hepatitis B (CHB). Tenofovir alafenamide (TAF) provides comparable antiviral efficacy to tenofovir disoproxil fumarate (TDF) with improved bone and renal safety. This study aimed to evaluate the real-world efficacy and safety of TAF in CHB patients.

Materials and Methods: Patients aged ≥ 18 years receiving TAF for ≥ 6 months between January 2019 and December 2025 were retrospectively analyzed. Coinfected patients and those with decompensated cirrhosis were excluded. Virological suppression was defined as hepatitis B virus (HBV)-DNA < 20 IU/mL, and biochemical response was defined as alanine aminotransferase (ALT) < 40 U/L.

Results: Among 100 patients (mean age 59.39 ± 12.67 years; 69% male), 91% had previously received TDF, with osteopenia/osteoporosis being the most common switching reason (67%). At one year, significant reductions were observed in aspartate aminotransferase ($p=0.001$) and ALT ($p=0.004$) levels, while serum creatinine and estimated glomerular filtration rate remained stable with no significant changes ($p=0.088$ and $p=0.571$, respectively). The ALT normalization rate remained stable during follow-up (91% at baseline vs. 94% at one year; $p=0.687$). HBV-DNA suppression was 77.3% at baseline and 97.2% at month 36, with complete virological response achieved in 98.8% of patients. Fibrosis-4 index and aspartate aminotransferase to platelet ratio index scores remained stable throughout follow-up. Hepatic steatosis was present in 39.6% of patients at baseline.

Conclusion: TAF therapy maintained high, sustained virological suppression and demonstrated a favorable renal safety profile in predominantly TDF-experienced patients with CHB.

Keywords: Drug substitution, chronic hepatitis B, tenofovir, treatment outcome

ÖZ

Amaç: Kronik hepatit B (KHB) yönetiminde nükleoz(t)id analogları ile uzun süreli viral süpresyon, hastalık progresyonunun önlenmesinde temel stratejidir. Tenofovir alafenamid (TAF), tenofovir disoproksil fumarat (TDF) ile benzer antiviral etkinlik sağlarken kemik ve renal güvenlik avantajları sunmaktadır. Bu çalışmada KHB hastalarında TAF tedavisinin gerçek yaşam etkinlik ve güvenliliğinin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntemler: Ocak 2019-Aralık 2025 tarihleri arasında en az 6 ay süreyle TAF tedavisi alan ≥ 18 yaş hastalar retrospektif olarak incelendi. Koenfeksiyonu olan ve dekompanse sirozlu hastalar dışlandı. Virolojik süpresyon hepatit B virüs (HBV)-DNA < 20 IU/mL, biyokimyasal yanıt alanin aminotransferaz (ALT) < 40 U/L olarak tanımlandı.

Bulgular: Çalışmaya dahil edilen 100 hastanın yaş ortalaması $59,39 \pm 12,67$ yıl olup %69'u erkekti. Hastaların %91'i daha önce TDF kullanmış olup en sık geçiş nedeni osteopeni/osteoporoz (%67) idi. Birinci yılda aspartat aminotransferaz ($p=0,001$) ve ALT ($p=0,004$) düzeylerinde anlamlı düşüş izlenirken, serum kreatinin ve tahmini glomerüler filtrasyon hızı değerlerinde anlamlı değişiklik saptanmadı (sırasıyla $p=0,088$ ve $p=0,571$). ALT normalizasyon oranı takip süresince stabil seyretti (%91'den %94'e; $p=0,687$). Başlangıçta %77,3 olan HBV-DNA süpresyon oranı 36. ayda %97,2 olarak saptandı ve hastaların %98,8'inde tam virolojik yanıt elde edildi. Fibrozis-4 indeksi ve aspartat aminotransferaz/trombosit oranı indeksi skorları takip süresince stabil kaldı. Hastaların %39,6'sında başlangıçta hepatosteatoz mevcuttu.

Sonuç: TAF tedavisi, ağırlıklı olarak TDF deneyimli KHB hastalarında yüksek ve sürdürülebilir virolojik baskılanmayı korumuş ve olumlu bir renal güvenlilik profili göstermiştir.

Anahtar Kelimeler: Tedavi değişimi, kronik hepatit B, tenofovir, tedavi sonuçları

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Introduction

Hepatitis B virus (HBV) infection remains a significant global public health concern. An estimated 254-296 million individuals worldwide are living with chronic hepatitis B (CHB) (1,2), and a substantial proportion face life-threatening complications, including cirrhosis, hepatocellular carcinoma, and liver failure (3). Since viral eradication is virtually unattainable with currently available therapies and hepatitis B surface antigen (HBsAg) loss is rarely achieved, the majority of patients require lifelong antiviral treatment (1,4). Consequently, long-term drug efficacy, resistance profile, and safety are decisive factors in clinical decision-making (1,4,5). Current international guidelines recommend potent nucleos(t)ide analogues-entecavir (ETV), tenofovir disoproxil fumarate (TDF), and tenofovir alafenamide (TAF)-as first-line agents, given their high antiviral potency and high barrier to resistance (1,2).

Long-term use of TDF has been associated with a decline in estimated glomerular filtration rate (eGFR), phosphaturia, and reduced bone mineral density, mediated primarily through proximal renal tubular injury (6). TAF was developed to address these safety concerns; its greater plasma stability enables efficient intracellular delivery of the active metabolite to hepatocytes with markedly lower systemic exposure (6,7). Plasma tenofovir levels with TAF are approximately 91% lower than those observed with TDF, resulting in a more favorable renal and bone safety profile while maintaining comparable antiviral efficacy (6,7,8,9).

This study aimed to evaluate the real-world virological and biochemical efficacy and renal safety of TAF therapy in patients with CHB.

Materials and Methods

This retrospective study included patients aged ≥ 18 years who were followed up with a diagnosis of CHB at our clinic and received TAF therapy for at least 6 months between January 2019 and December 2025. Patients with hepatitis C virus, hepatitis D virus, or human immunodeficiency coinfection; a history of liver transplantation; decompensated cirrhosis; or a follow-up duration of less than 6 months were excluded. Data were retrieved in anonymized form from the hospital electronic medical records and patient files. The study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Non-Pharmaceutical and Non-Medical Device Research of Necmettin Erbakan University Ethics Committee (approval no: 2026/6447, date: 27.03.2026). Informed consent was waived by the ethics committee given the retrospective nature of the study.

CHB was defined as HBsAg positivity persisting for more than 6 months. HBsAg was measured using a chemiluminescent immunoassay. Results were reported as signal-to-cut-off (S/CO) ratios, reflecting assay reactivity rather than quantitative HBsAg concentrations (IU/mL). Complete virological response was defined as HBV-DNA < 20 IU/mL, and biochemical response was defined as alanine aminotransferase (ALT) < 40 U/L, in accordance with

European Association for the Study of the Liver and Asian Pacific Association for the Study of the Liver guidelines (1,10). Liver biopsy results were staged according to the Ishak score, with F4-F6 classified as advanced fibrosis. Non-invasive fibrosis markers were calculated using the following formulas: aspartate aminotransferase (AST) to platelet ratio index (APRI) = $[(\text{AST}/\text{upper limit of normal})/(\text{platelet count}) \times 100]$; fibrosis-4 index (FIB-4) = $(\text{age} \times \text{AST})/(\text{platelet count} \times \sqrt{\text{ALT}})$. The upper limit of normal for AST was set at 40 U/L. Laboratory, virological, and ultrasonographic data were recorded at months 3, 6, 12, 24, and 36.

The reasons for switching from TDF to TAF were retrospectively identified from the patients' medical records. Osteopenia and osteoporosis were determined based on dual-energy X-ray absorptiometry reports available in the medical records. Osteopenia was defined as a T-score between -1.0 and -2.5, and osteoporosis as a T-score of ≤ -2.5 , according to the World Health Organization criteria, as described by Kanis et al (11). Elevated serum creatinine was defined as a value > 1.2 mg/dL, corresponding to the upper limit of normal in our laboratory, and hypophosphatemia was defined as a serum phosphorus level < 2.5 mg/dL. These findings were considered treatment-related adverse events if documented in the medical records as the reason for switching to TAF.

Statistical Analysis

Statistical analyses were performed using SPSS for Windows v.18.0 (SPSS Inc., Chicago, IL, USA). The normality of continuous variables was assessed using the Shapiro-Wilk test and visual methods. Data were presented as mean $\pm$ standard deviation or median (first-third quartiles) according to distribution characteristics, and categorical variables were expressed as numbers and percentages [n(%)]. The Wilcoxon signed-rank test was used for paired comparisons, and the Friedman test, with post-hoc pairwise comparisons, was applied to repeated measurements at three or more time points. HBV-DNA suppression rates over time were assessed using the Cochran Q test, and ALT normalization rates were compared using the McNemar test. The number of patients included in each analysis was limited to those with complete data for the relevant parameter at both baseline and follow-up; multiple imputation was not performed and a complete-case analysis was adopted. The sample size for each analysis was specified in the corresponding tables and figures. A p-value of < 0.05 was considered statistically significant.

Results

A total of 111 patients diagnosed with CHB who were initiated on TAF therapy between January 2019 and December 2025 were screened. After applying the exclusion criteria, 100 patients were included in the study (Figure 1). The mean age was 59.39 ± 12.67 years and 69% were male. Among 90 patients with available serological data, 14 (15.6%) were HBeAg-positive and 74 (82.2%) were anti-HBe-positive. Regarding treatment history, 91% of patients had previously received TDF, whereas 8% were treatment-naïve (Table 1). The most common reason for switching from TDF to TAF was osteopenia/osteoporosis (67%). The median duration of TAF therapy was 30

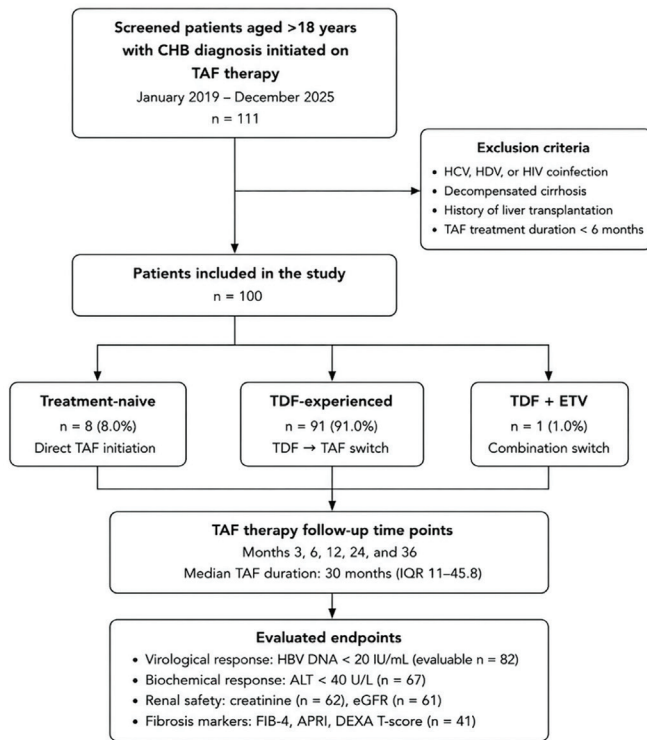


Figure 1. Study flowchart

TAF: Tenofovir alafenamide, TDF: Tenofovir disoproxil fumarate, ETV: Entecavir, CHB: Chronic hepatitis B, HBV: Hepatitis B virus, HCV: Hepatitis C virus, HDV: Hepatitis D virus, HIV: Human immunodeficiency virus, ALT: Alanine aminotransferase, eGFR: Estimated glomerular filtration rate, IQR: Interquartile range, FIB-4: Fibrosis-4 index APRI: Aspartate aminotransferase to platelet ratio index

months (interquartile range: 11-45.8) (Table 1).

Laboratory parameters were compared between baseline and year one of TAF therapy. The median AST level at year one was significantly lower than the baseline value [16.2 (14-19) U/L vs. 18 (15-22) U/L; $p=0.001$]. Similarly, ALT levels decreased significantly at year one [17 (13-21) U/L vs. 18 (14-24) U/L; $p=0.004$]. No significant changes were observed in serum creatinine or eGFR after one year of TAF therapy ($p=0.088$ and $p=0.571$, respectively). A comparison of biochemical, hematological, and metabolic laboratory parameters between baseline and year one is presented in Table 2.

HBV-DNA suppression rates were 77.3% (75/97) at baseline, 92.1% (35/38) at month 3, 88% (44/50) at month 6, 91% (61/67) at month 12, 98.1% (51/52) at month 24, and 97.2% (35/36) at month 36. No statistically significant difference was observed in the overall comparison across time points (Cochran Q test; $p=0.352$). Complete virological response was achieved in 81 of 82 evaluable patients (98.8%), and partial virological response in 1 patient (1.2%). HBsAg S/CO ratios remained generally stable throughout the follow-up period. Although the overall Friedman test indicated a statistically significant difference ($p=0.008$), pairwise comparisons revealed no significant change between baseline and year 1 ($p=0.067$) or between baseline and the last follow-up visit ($p=0.678$). No patient

Table 1. Baseline demographic characteristics, prior treatment history, and distribution of adverse effects attributed to prior therapy

Variable	All patients (n=100)
Age (years), mean $\pm$ SD	59.39 $\pm$ 12.67
Sex, n (%)	
Male	69 (69.0)
Female	31 (31.0)
Duration of TAF therapy (months), median (IQR)	30.0 (11.0-45.8)
Prior treatment before TAF, n (%)	
Treatment-naïve	8 (8.0)
TDF	91 (91.0)
TDF+ETV	1 (1.0)
Presence of adverse effects related to prior therapy, n (%)	
No	9 (9.0)
Yes	91 (91.0)
Adverse effects related to prior therapy (n=91)*, n (%)	
Osteopenia/osteoporosis	61 (67.0)
Creatinine elevation	8 (8.8)
Hypophosphatemia	15 (16.5)
Nausea/vomiting	2 (2.2)
Allergy	1 (1.1)
Proteinuria	1 (1.1)
Unknown type of adverse effect	8 (8.8)

*: Adverse effects related to prior therapy were evaluated only in patients who developed adverse effects (n=91), SD: Standard deviation, IQR: Interquartile range (first quartile-third quartile), ETV: Entecavir, TAF: Tenofovir alafenamide, TDF: Tenofovir disoproxil fumarate

achieved HBsAg seroconversion during follow-up.

The proportion of patients with normal ALT levels was 91% at baseline and increased to 94% at year one of TAF therapy; however, this increase was not statistically significant ($p=0.687$) (Table 3). The median FIB-4 index was 1.04 (0.81-1.25) at baseline and 1.06 (0.78-1.27) at year one ($p=0.820$). The median APRI score remained stable at 0.20 (0.10-0.20) at both baseline and year one ($p=0.454$). Among 93 patients with available liver biopsy results, the median fibrosis stage was 3 (2-3) and the histological activity index score was 8 (6,7,8,9,10). Stage 2 fibrosis was present in 50.5% of patients, whereas advanced fibrosis (Ishak F4-F6) was identified in 10 patients (10.8%).

On ultrasonographic evaluation, normal liver findings were observed in 47.9% of patients, whereas hepatic steatosis and signs of chronic liver disease were detected in 39.6% and 12.5%, respectively. During the follow-up period, 99% of patients remained alive; 1 patient (1%) died.

Discussion

Current guidelines recommend TAF as an important treatment option for CHB, owing to its potent antiviral efficacy and a more

Table 2. Comparison of biochemical, hematological, and metabolic laboratory parameters between baseline and year one of TAF therapy

Parameter	n	Baseline	Year 1	p*
		Median (IQR)	Median (IQR)	
AST, U/L	68	18 (15-22)	16.2 (14-19)	0.001
ALT, U/L	67	18 (14-24)	17 (13-21)	0.004
Platelet count, $\times 10^9/L$	85	239 (204-291)	–	–
ALP, U/L	18	83.5 (72.7-126.7)	–	–
AFP, ng/mL	84	1.99 (1.39-3.04)	–	–
BUN, mg/dL	96	33 (26.0-38.5)	–	–
Creatinine, mg/dL	62	0.97 (0.81-1.11)	0.94 (0.81-1.07)	0.088
eGFR, mL/min/1.73 m ²	61	80.5 (67.8-99.0)	82 (70-95)	0.571
Phosphorus, mg/dL	80	3.02 (2.46-3.64)	–	–
HDL, mg/dL	8	47 (41-54)	49.5 (46.5-57)	0.916
LDL, mg/dL	8	114 (84-143)	107.5 (87-146.2)	0.345
Bone T-score (vertebra)	41	-1.20 (-1.95- -0.25)	–	–
Bone T-score (femur)	41	-1.70 (-2.10- -1.10)	–	–

Median (IQR): median (first quartile-third quartile), *: p-values were calculated using the Wilcoxon signed-rank test, AFP: Alpha-fetoprotein, ALP: Alkaline phosphatase, ALT: Alanine aminotransferase, AST: Aspartate aminotransferase, BUN: Blood urea nitrogen, eGFR: Estimated glomerular filtration rate, HDL: High-density lipoprotein, LDL: Low-density lipoprotein, TAF: Tenofovir alafenamide, IQR: Interquartile range

Table 3. Comparison of ALT normalization rates at baseline and year one of TAF therapy

ALT status	Baseline	Year 1	p*
	n (%)	n (%)	
>40 U/L	6 (9.0)	4 (6.0)	0.687
<40 U/L	61 (91.0)	63 (94.0)	
Total	67 (100)	67 (100)	

ALT normalization was defined as ALT <40 U/L. *: Comparison between baseline and year one was assessed using the McNemar test, ALT: Alanine aminotransferase, TAF: Tenofovir alafenamide

favorable bone and renal safety profile. Unlike randomized controlled trials, real-world data are particularly valuable as they better reflect patient heterogeneity and long-term treatment outcomes. This study aimed to contribute to the literature on the efficacy and safety profile of TAF therapy in routine clinical practice.

Clinical guidelines and expert opinions recommend TAF as a preferred option in patients over 50 years of age and postmenopausal women, given their increased risk of bone and renal complications (12). Accordingly, real-world studies have shown that CHB patients receiving TAF are predominantly middle-aged or older. Chen et al. (5) reported a mean age of 52.8 years and a male proportion of 71.6% in a real-world cohort of 148 patients. In the prospective study by Song et al. (13), the mean age was 47.6 years in treatment-naïve and 50.2 years in treatment-experienced patients, with male proportions ranging from 70% to 79.8%. In our study, the mean age was 59.4 years, and 69% of participants were male. The higher mean age in our cohort, compared with values reported in the literature, is consistent with the predominance of patients who switched to TAF because of bone complications associated with long-term TDF use.

The HBeAg serological profile is a critical factor in CHB management, as it determines both the risk of infectivity and the rate of treatment response. HBeAg-negative patients have been shown to achieve virological suppression more rapidly than HBeAg-positive patients. In the literature, HBeAg positivity rates in TAF studies vary widely, ranging from 19.4% to 73.8% (3,4,5,8). In our cohort, the HBeAg positivity rate was 15.6%. This lower rate can be explained not only by the patients' prior antiviral treatment but also by the epidemiological characteristics of our region. The high prevalence of precore and basal core promoter mutations in the Mediterranean basin, including Türkiye, is the primary determinant of the predominantly HBeAg-negative CHB phenotype observed in the majority of patients (14).

Prior TDF experience rates before TAF initiation range from 29.5% to 71% in the literature (3,4,13). In a real-world study by Hige et al. (15) including 580 patients, 81.6% were treatment-experienced, with prior TDF and ETV use reported in 56.9% and 54.5%, respectively. In the study by Song et al. (13), 62.8% of patients had prior TDF experience and 38.2% had prior ETV experience; the main reasons for switching to TAF were renal tubular damage (27.7%), creatinine elevation (22.3%), low-level viremia (11.7%), and bone/renal safety concerns. In our cohort, 91% of patients had received TDF prior to TAF, and 91% had switched because of adverse effects, with osteopenia/osteoporosis (67%) the most common reason. The notably higher rate of TDF use in our cohort, compared with the literature, reflects that the decision to switch to TAF at our center was predominantly driven by the emergence of TDF-related complications. This finding supports the view that bone mineral density loss associated with long-term TDF use is one of the primary determinants of treatment switching and that TAF is preferred in this patient population owing to its bone-safety advantage.

Real-world studies consistently demonstrate that switching to TAF maintains and further improves virological suppression achieved with previous antiviral therapy. In a multicenter Japanese study, HBV-DNA suppression in treatment-experienced patients increased from 83% at baseline to 95.7% at week 48 and 98.6% at week 144 (15). Similarly, Song et al. (13) reported an increase in virological suppression from 76.6% at baseline to 89% at week 48 and 100% from week 96 onward after switching to TAF. Long-term phase 3 studies likewise demonstrated sustained virological response rates approaching 98% over 8 years, with no evidence of resistance following treatment switch (16,17). Consistent with these findings, HBV-DNA suppression in our cohort increased from 77.3% at baseline to 98.1% at month 24, and complete virological response was achieved in 98.8% of evaluable patients. The relatively high baseline suppression rate reflects the predominance of TDF-experienced patients and indicates that switching to TAF successfully maintained long-term viral suppression in routine clinical practice.

ALT normalization is a key therapeutic target in CHB management (5,15). Phase 3 studies demonstrated higher ALT normalization rates with TAF than with TDF, while real-world studies have confirmed sustained biochemical response after switching to TAF (12,13). In our cohort, the ALT normalization rate remained stable during follow-up (91% at baseline vs. 94% at one year; $p=0.687$). The high baseline normalization rate most likely reflects the predominance of treatment-experienced patients who had already achieved biochemical control before switching, suggesting that TAF successfully maintained biochemical remission during follow-up.

The proximal tubulotoxic effect of TDF is well established and has been associated with eGFR decline during long-term therapy (6,18). In contrast, TAF provides lower systemic tenofovir exposure and better renal safety (12,19). Real-world studies consistently demonstrate stabilization or improvement of renal function following switching from TDF to TAF, particularly in patients with impaired renal function (4,8,20). In our study, serum creatinine and eGFR remained stable during follow-up, indicating preservation of renal function without clinically significant deterioration. The absence of significant improvement is likely related to the relatively preserved baseline renal function in our cohort and to early switching before irreversible renal impairment developed.

The metabolic effects of TAF, particularly on lipid parameters, remain an area of ongoing investigation. Although previous studies have reported modest increases in serum lipid levels after switching from TDF to TAF (8,13,21), our analysis included only a limited number of patients with available lipid measurements. Therefore, no definitive conclusions regarding the metabolic effects of TAF can be drawn from our cohort, and these findings should be interpreted cautiously.

HBsAg loss is considered the optimal endpoint of CHB treatment and is widely accepted as a marker of functional cure. However, HBsAg loss during nucleos(t)ide analogue therapy remains uncommon, with an annual incidence of approximately 0.3-0.8% (16,22,23,24). Long-term studies of TAF have likewise reported low rates of HBsAg loss, even after prolonged treatment (13,16). Consistent

with these findings, no patient in our cohort achieved HBsAg loss during follow-up. In addition, HBsAg reactivity, assessed using the chemiluminescent assay S/CO ratio, remained generally stable throughout follow-up. Since S/CO values reflect assay reactivity rather than quantitative HBsAg concentrations, they should not be interpreted as a measure of changes in HBsAg levels. Therefore, our findings primarily support the persistence of HBsAg positivity during follow-up rather than changes in quantitative HBsAg kinetics.

Long-term viral suppression with nucleos(t)ide analogue therapy is associated with fibrosis regression and a reduced risk of cirrhosis. Accordingly, non-invasive fibrosis markers such as FIB-4 and APRI are widely used for longitudinal assessment. Long-term TAF studies have demonstrated favorable fibrosis outcomes. In 8-year phase 3 studies, the proportion of patients with cirrhosis assessed by FibroTest decreased significantly over time (16), while Ogawa et al. (4) reported a significant reduction in FIB-4 among patients with cirrhosis after 5 years of TAF therapy. More recently, Gezer et al. (25) demonstrated that concomitant metabolic dysfunction-associated steatotic liver disease may influence the diagnostic performance of non-invasive fibrosis markers in patients with CHB, highlighting that metabolic status should be considered when interpreting FIB-4 and APRI results. In our cohort, both FIB-4 and APRI remained stable during the first year of treatment. Given that most patients were TDF-experienced, had low baseline fibrosis scores, and had established virological suppression, this finding likely reflects maintenance of a favorable fibrosis status rather than measurable regression. Longer prospective studies including patients with advanced fibrosis are needed to better evaluate the antifibrotic effects of TAF.

Hepatic steatosis is a common comorbidity in patients with CHB. In a systematic review and meta-analysis including 54 studies (28,648 patients), Zheng et al. (26) reported a pooled prevalence of hepatic steatosis of 32.8% and demonstrated that steatosis was primarily associated with host metabolic factors, including obesity, dyslipidemia, and diabetes, rather than HBV-related viral factors. Similarly, Rastogi et al. (27) found that hepatic steatosis was independently associated with serum triglyceride levels, irrespective of viral characteristics. In our study, hepatic steatosis was detected by ultrasonography in 39.6% of patients, which is consistent with the prevalence reported in previous studies. As steatosis was present at baseline, it could not be attributed to TAF therapy. However, the absence of detailed metabolic data, including body mass index and lipid profile analyses stratified by steatosis status, represents a limitation of our study. Further prospective studies incorporating comprehensive metabolic assessments are warranted to better define the relationship between TAF therapy and hepatic steatosis.

Study Limitations

The retrospective design and single-center nature of our study represent the main limitations for establishing causal relationships and generalizing the results. The absence of a comparator group continuing TDF limits the ability to attribute observed changes directly to TAF. The availability of lipid data for only a limited number of patients ($n=8$) and the lack of subgroup comparisons of body

mass index and lipid profile between patients with and without steatosis constitute additional important limitations. Furthermore, quantitative HBsAg measurements were not available, precluding assessment of HBsAg kinetics during follow-up. Nevertheless, our study contributes to the existing literature by reflecting real-world clinical practice with a follow-up period of up to 36 months.

Conclusion

In this real-world study, TAF therapy maintained high and sustained virological suppression, preserved biochemical response, and demonstrated a favorable renal safety profile in a predominantly TDF-experienced CHB cohort. These findings support the effectiveness and safety of TAF in routine clinical practice. Larger multicenter prospective studies are warranted to further evaluate its long-term clinical outcomes.

Ethics

Ethics Committee Approval: The study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the Non-Pharmaceutical and Non-Medical Device Research of Necmettin Erbakan University Ethics Committee (approval no: 2026/6447, date: 27.03.2026).

Informed Consent: Informed consent was waived by the ethics committee given the retrospective nature of the study.

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Artificial intelligence (ChatGPT, OpenAI) was used solely to assist with English-language editing, text refinement, and the visual design and formatting of Figure 1. The AI tool was not used for data collection, data analysis, interpretation of results, or generation of scientific conclusions. All scientific content, including the study design, data interpretation, manuscript revisions, and the final manuscript, was critically reviewed, verified, and approved by the authors, who take full responsibility for the content of this work.

Footnotes

Authorship Contributions

Surgical and Medical Practices: R.B., B.K., E.K.K., İ.E., Concept: R.B., B.K., E.K.K., İ.E., Design: R.B., İ.E., Data Collection or Processing: R.B., M.Y., T.E.G., Analysis or Interpretation: R.B., M.Y., Literature Search: R.B., P.B.K., B.K., T.E.G., Writing: R.B., P.B.K., B.K., M.Y., E.K.K., İ.E., T.E.G.

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