KHB ve KHC Tedavisinde Yan Etki Yönetimi:

Olgu: KHB ve Lipid Yönetimi

Dr Emel YILMAZ

BUÜTF Enf Hast ve Kl Mik AD

Görükle-BURSA

Olgu (Kasım 2015)

- MA
- 56 yaş (1959 doğumlu), erkek
- Emekli memur
- Erzurum

Olgu

- **Yakınması:** yok

- **Hikayesi:** Yaklaşık 15 yıldır kronik hepatit B tanısı almış (2000'den itibaren)

Olgu-Hikaye devam

- Hastaya 2005 yılında biyopsi yapılmış
  - Patoloji raporu HAİ: 7, Fibrozis: 2
  - Lamivudin başlanmış
- Yaklaşık 8-9 yıl kadar hastaya Lamivudin ile tedavi verilmiş
- Hastanın kontrol HBV DNA'sında 9 yıldır negatiflik varken yükselmeye başlamış
- En son HBV DNA 5934 IU/mL (dış merkezli)

- Hasta yaklaşık toplamda (2005’ten itibaren) 10 yıldır tedavi alıyorken il değişikliği nedeniyle merkezimize başvurdu

Olgu

- **Özgeçmiş:**
  - Sigara kullanımı yok,
  - Alkol yok
  - Transfüzyon öyküsü yok
  - Ameliyat yok
  - Komorbid hastalığı yok
- **Soy geçmiş:**
  - Anne siroz nedeniyle exitus
  - Baba MI nedeniyle exitus
  - 5 kardeşi var, hayatta; 3 kardeşinde karaciğer hastalığı mevcut

Olgu

- Detayı çok bilmiyoruz
  - Düzenli ilaç almamış olabilir
    - Hasta düzenli kullandığını ifade ediyor
  - Direnç gelişmiş olabilir

Tedavi değişikliği yapılmış mıdır?
Hangi tedavi uygun???

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Table 7. Management of patients who develop NA resistance.

Resistance pattern	Recommended rescue strategies
LAM resistance	Switch to TDF or TAF
TBV resistance	Switch to TDF or TAF
ETV resistance	Switch to TDF or TAF
ADV resistance	If LAM-naïve: switch to ETV or TDF or TAF If LAM-resistance: switch to TDF or TAF If HBV DNA plateaus: add ETV*** or switch to ETV
TDF or TAF resistance**	If LAM-naïve: switch to ETV If LAM-R: add ETV*
Multidrug resistance	Switch to ETV plus TDF or TAF combination

ETV, entecavir; TDF, tenofovir disoproxil fumarate; TAF, tenofovir alafenamide; LAM, lamivudine; ADV, adefovir; TBV, telbivudine.

* The long-term safety of these combinations is unknown.

** Not seen clinically so far; do genotyping and phenotyping in an expert laboratory to determine the cross-resistance profile.

*** Especially in patients with ADV resistant mutations (rA181T/V and/or rN236T) and high viral load, the response to TDF (TAF) can be protracted.

Journal of Hepatology **2017** vol. 67 | 370–398

Olgu

Bildiğimiz kadarıyla Direnç testi yapılmamış

Tablo 5. Antiviral Direnç Durumunda Tedavi Yönetimi

Tedavi Yönetimi	
LAM Direnci	TDF ya da TAF'a geçilir.
ADV Direnci	Entekavire geçilir.
Telbivudin Direnci	TDF ya da TAF'a geçilir.
Entekavir Direnci	TDF ya da TAF'a geçilir.
***TDF Direnci**	Entekavire geçilir ya da entekavir eklenir.

*Lamivudin direnci olan hastalarda entekavir eklenmesi, olmayanlarda entekavire geçilmesi önerilir.

Demirtürk N Klimik Dergisi 2023; 36(Özel Sayı 1): 1-22

- Hastaya TDF (tenofovir disoproksil fumarat) başlanıyor

- Hasta daha sonra bizde takibe alınıyor

13.11.2015-Başvuru

- Hemogram
  - BK: 7050/mm3
  - Hb: 14,2 mg/dL
  - PLT: 222.000/mm3

HBV DNA: negatif

- HBs Ag: (+)
- AntiHBs: (-)
- HBe Ag: (-)
- AntiHBe: (+)
- AntiHBc IgM: (-)
- AntiHBc IgG: (+)
- AntiHDV: (-)
- AntiHCV: (-)

- Kan biyokimyası
  - Glu: 89 mg/dL
  - Üre: 22,8 mg/dL
  - BUN: 15,9 mg/dL
  - Kreat: 0,8 mg/dL
  - GFR: 92ml/dk (1,73 m2)
  - ALT: 20 IU/L
  - AST: 20 IU/L
  - GGT: 28 U/L
  - ALP: 63 U/L

- Kan biyokimyası
  - T.Prot: 72 g/L (66-81)
  - Alb: 43 g/L (40-50)
  - INR: 0,96
  - AFP: 1,5 µg/L (1,09-8,4)
  - T Bil: 0,54 mg/dL
  - D. Bil: 0,22 mg/dL
- Lipid profili
  - TG: 90 mg/dL (40-150)
  - T Kol: 150 mg/dL (130-200)
  - HDL: 42 mg/dL (>40)
  - LDL: 120 mg/dL (60-130)
- Ca: 9,2 mg/dL
- Fosfor: 3,9 mg/dL

USG: Özellik yok

Tedavi takibi nasıl olmalı?

- ALT/AST
  - İlk yıl 3-4 ayda bir
  - Sonraki yıllar, 6 ayda bir
- HBV DNA
  - İlk yıl; DNA negatif oluncaya kadar her ay
  - Sonraki yıllar 6-12 ayda bir
- HBsAg
  - HBV DNA negatifleştiyse 12 ayda bir
- AntiHBs
  - HBs Ag negatifleştikten sob-nra yılda bir
- Kemik ölçümü
  - Yaşa göre yılda bir
- HSK
  - 6-12 ayda bir USG, AFP

Lipid profili 6 ayda bir (risk grubunda)

Journal of Hepatology **2017** vol. 67 | 370–398

Olgu

- 2015-2019 tarihleri arasında TDF ile hasta düzenli takip ediliyor
  - 6 ayda bir KCFT, Hemogram, Renal fonksiyonlar ve TİT ile takipli
  - 6-12 ayda bir AFP
  - İlk zamanlarda 6 ayda bir sonra yıllık HBV DNA
  - Yıllık USG

2019'da

- Bel ağrısı, kas-eklem ağrıları olan hastanın tetkikleri isteniyor
- Dexa isteniyor

25 OH vit D: 13 µg/L (20-50)
Parathormon: 45,9 ng/L (15-68,3)

- Kan biyokimyası
  - Glu: 91 mg/dL
  - Üre: 30,8 mg/dL
  - BUN: 15,9 mg/dL
  - Kreat: 0,8 mg/dL
  - GFR: 88ml/dk (1,73 m2)
  - ALT: 34 IU/L
  - AST: 23 IU/L
  - INR: 0,96
  - AFP: 1,5 µg/L
- TG: 101 mg/dL (40-150)
- HDL: 47 mg/dL (>40)
- T Kol: 180 mg/dL (130-200)
- LDL: 130 mg/dL (60-130)
- Ca: 9,2 mg/dL
- Fosfor: 3,9 mg/dL

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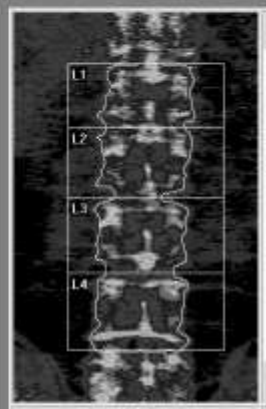
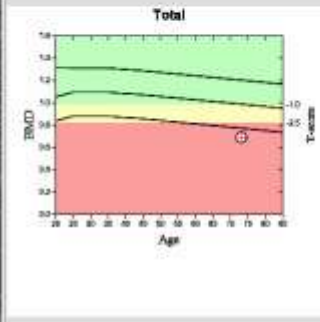
RADYOLOJI ANA BILIMDALI
BURSA

Patient Information:





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Comment:	
Software version:	13.6.0.4

Results Summary:

Region	Area[cm²]	BMC[g]	BMD[g/cm²]	T-score	PR (Peak Reference)	Z-score	AM (Age Matched)
L1	14.64	10.42	0.7[illegible]2	-3.3	66	-2.4	73
L2	15.78	10.93	0.6[illegible]3	-3.6	63	-2.7	70
L3	17.13	11.85	0.6[illegible]2	-3.7	63	-2.8	70
L4	18.85	12.45	0.6[illegible]0	-3.9	61	-2.9	68
Total	66.39	45.65	0.6[illegible]	-3.7	63	-2.7	70

Total BMD CV 1.0%, ACF = 1.017, BCF = 1.014, TH = 7.257

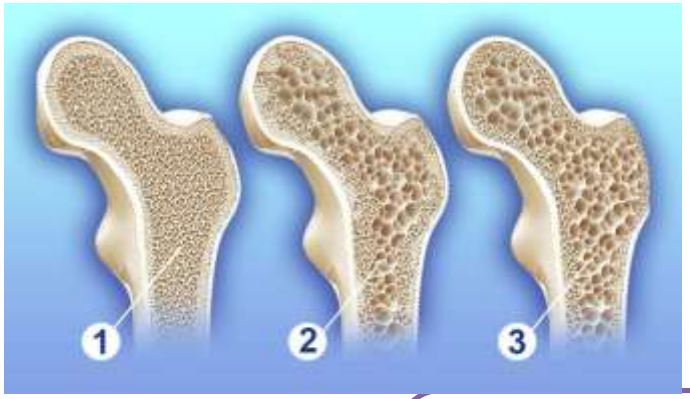
Fracture Risk: High; WHO Classification: Osteoporosis

Comment:

HOLOGIC

DEXA:
-1'in üzerindeki değerler normaldir.
-1 ile -2.5 arasındaki değerler kemik kaybının ilk safhası olan osteopeni'yi gösterir.
-2.5'tan küçük değerler ise osteoporoz lehine yorumlanır.

Kırılma Riski Yüksek
WHO sınıflamasına göre Osteoporoz



Endokrinoloji konsültasyonu istendi

2x1/gün Kalsiyum karbonat (3 g)+Vit D3 (800IU) (Calcimax D)
+
1/hafta Na trihidrat (70 g)+ Vit D3 kolekalsiferol (5600 IU) (Fosavance)

1/ yıl Zoledronik asit (4 mg/100mL) (Zometa/Aclasta)

- Biz ne yapalım?

Tedavi değişikliği?

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Table 5. Indications for selecting ETV or TAF over TDF.*

1. Age >60 years
2. Bone disease
Chronic steroid use or use of other medications that worsen bone density
History of fragility fracture
Osteoporosis
3. Renal alteration**
eGFR <60 ml/min/1.73 m^2
Albuminuria >30 mg/24 h or moderate dipstick proteinuria
Low phosphate (<2.5 mg/dl)
Hemodialysis

* TAF should be preferred to ETV in patients with previous exposure to nucleoside analogues.

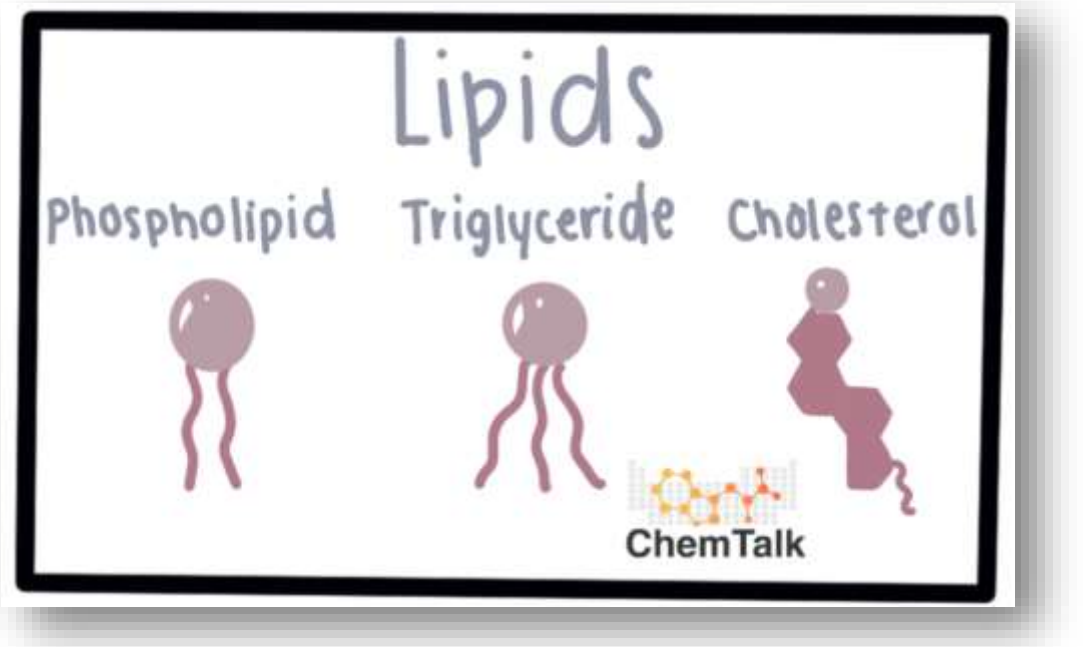
** ETV dose needs to be adjusted if eGFR <50 ml/min; no dose adjustment of TAF is required in adults or adolescents (aged at least 12 years and of at least 35 kg body weight) with estimated creatinine clearance (CrCl) ⩾15 ml/min or in patients with CrCl <15 ml/min who are receiving haemodialysis.

12.12.2019

- 2019’da tedavi TDF’den (tenofovir
- disporoksil fumarat) TAF’a (tenofovir alafenamid fumarat) geçiliyor

- Takipte
  - HBV DNA
  - KCFT
  - Renal fonksiyonlar
  - AFP
  - Seroloji
  - Batın USG’sinde değişiklik yok

- Takiplerde hangi parametrelere dikkat edelim???



Plum et al. BMC Infect Dis (2021) 21:910
https://doi.org/10.1186/s12879-021-06479-9

BMC Infectious Diseases

RESEARCH Open Access

Impact of switch from tenofovir disoproxil fumarate-based regimens to tenofovir alafenamide-based regimens on lipid profile, weight gain and cardiovascular risk score in people living with HIV

Pierre-Emmanuel Plum[1], Nathalie Maes[2], Anne-Sophie Sauvage[1], Frédéric Frippiat[1], Christelle Meuris[1],

Table. 2 Evolution of lipid parameters

A. TDF/TDF group, Mean [95%CI] (N = 31)

	N	2016	2018	Evolution 2018–2016	p-value
Triglycerides (mg/dL)	31	134 [104;164]	116 [91;141]	−18 [−49;13]	0.26
TC (mg/dL)	31	184 [170;199]	176 [161;191]	−8.5 [−16;−1.0]	**0.028**
LDL Cholesterol (mg/dL)	1	107 [94;119]	103 [89;117]	−3.8 [−12;4.8]	0.38
HDL Cholesterol (mg/dL)	31	51 [47;56]	50 [45;55]	−1.2 [−4.3;1.9]	0.44
TC/HDL ratio	31	3.8 [3.4;4.3]	3.7 [3.3;4.2]	−0.087 [−0.37;0.19]	0.53

B. Evolution of lipid parameters in TDF/TAF group, Mean [95%CI] (N = 98)

	N	Before (on TDF)	After (on TAF)	Evolution After–Before	p-value
Triglycerides (mg/dL)	98	123 [110;136]	143 [124;161]	20 [7;33]	**0.0026**
TC (mg/dL)	98	183 [176;191]	192 [185;199]	8.7 [3.1; 14]	**0.0026**
LDL Cholesterol (mg/dL)	95	103 [97;110	105 [99;111]	1.7 [−3.0;6.4]	0.48
HDL Cholesterol (mg/dL)	96	56 [52;53]	59 [55;63]	2.9 [0.75;5.0]	**0.0084**
TC/HDL ratio	96	3.6 [3.3;3.8]	3.5 [3.3;3.8]	−0.023 [−0.18;0.13]	0.77

Plum PE et al. BMC Infect Dis 2021; 21: 910

Hastanın Lipid Profili Nasıl?

Tarih	Tedavi	Trigliserid mg/dL	T. Kol	LDL	HDL
12.12.2019	TDF	101	180	130	47
02.03.2021	TAF	142	**304**	**222**	54
21.09.2021	TAF	67	**350**	**270**	57

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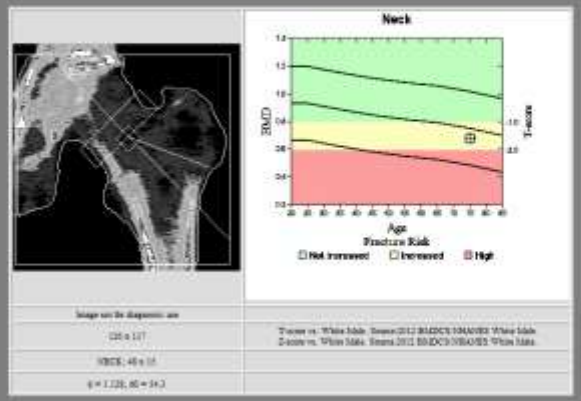

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Institution:	ULUDAG UNIVERSITESI TIP FAKULTESI HASTANESI
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Model:	Horizon Wi (S/N201290)
Comment:	
Software version:	13.6.0.4

Results Summary:

Region	Area[cm²]	BMC[g]	BMD[g/cm²]	T-score	PR (Peak Reference)	Z-score	AM (Age Matched)
Neck	5.48	3.71	0.677	-1.9	73	-0.5	90
Troch	14.45	8.18	0.566	-1.7	73	-1.1	80
Inter	28.77	30.61	1.064	-0.7	89	0.0	101
Total	48.70	42.50	0.873	-1.1	84	-0.2	96
Ward's	1.11	0.52	0.470	-2.2	60	-0.1	97

Total BMD CV 1.0%, ACF = 1.037, BCF = 1.014, TH = 5.706

Fracture Risk: Increased; WHO Classification: Osteopenia

Comment:

HOLOGIC

5 yıl

emek için tıklatın

in tıklatın

Endokrinoloji konsültasyonu istendi

2x1/gün Kalsiyum karbonat (3 g)+Vit D3 (800IU) (Calcimax D)
+
1/hafta Na trihidrat (70 g)+ Vit D3 kolelasiferol (5600 IU) (Fosavance)

1/ yıl Zoledronik asit (4 mg/100mL) (Zometa/Aclasta)

Diğer Dexa lara göre gerileme mevcut

Ne yapalım????

- Tedavi değişikliği????

- TAF ‘e devam
- TDF’e tekrar geçelim
- ETV’e bir şans verelim

- Antilipid tedavi???


ADALET İSTİYORUZ!
VALLA YOK OLSA VERMEZ MİYİM!

- Atorvastatin (10 mg/gün) başlandı
- İlaç/ilaç etkileşimi kontrol edildi

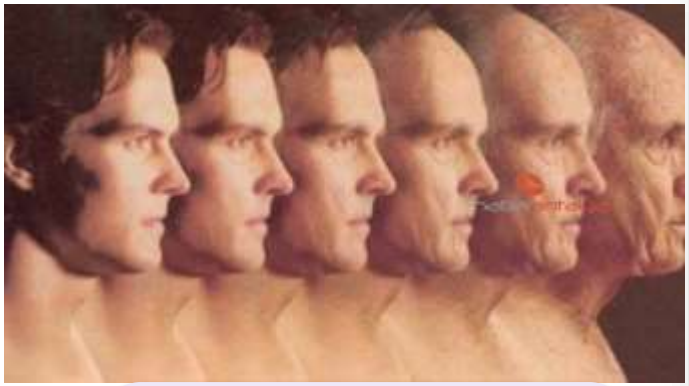
Tarih	Tedavi	Trigliserid mg/dL (40-150)	T. Kol mg/dL (130-200)	LDL mg/dL (60-130)	HDL mg/dL (>40)
12.12.2019	TDF	101	180	130	47
02.03.2021	TAF	142	304	222	54
21.09.2021	TAF	67	350	270	57
21.12.2022	TAF	80	280	190	45
02.05.2023	TAF	50	183	110	63
09.12.2023	TAF	83	187	108	62
17.05.2024	TAF	52	184	117	57

Tablo 1. Total KVH risk hesaplama sistemleri

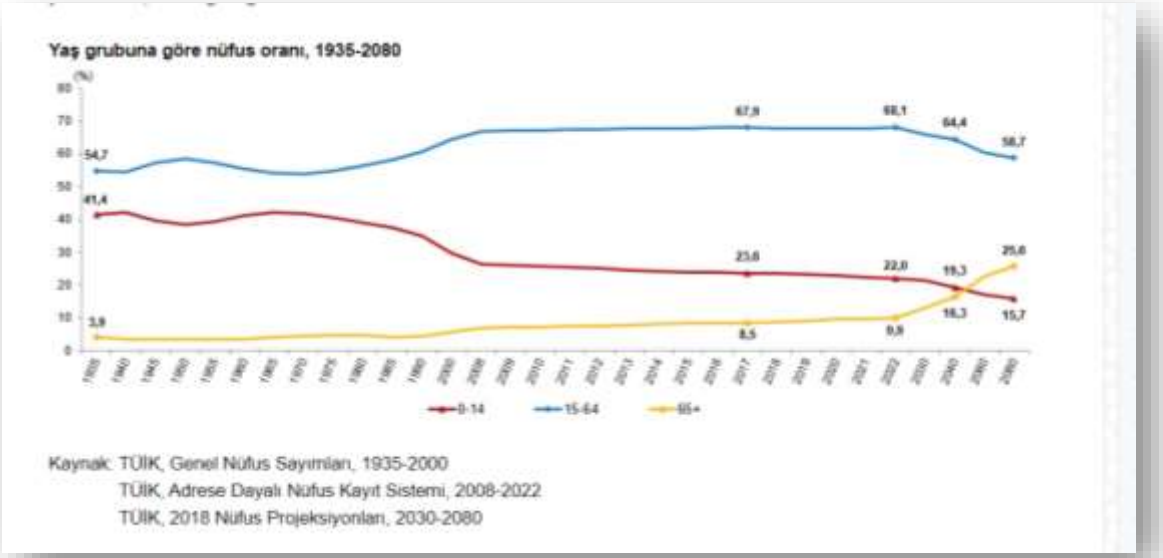
Sistem	Risk	Değişkenler
Framingham modeli (12)	10 yıllık KVO riski	Cinsiyet, yaş, Total-K, HDL-K, Sistolik kan basıncı, sigara, DM, HT tedavisi
SCORE (10)	10 yıllık KVH ölüm riski	Cinsiyet, yaş, Total-K veya TK/HDL-K, Sistolik kan basıncı, sigara
ASSIGN (13)	10 yıllık KVO riski	Cinsiyet, yaş, Total-K, HDL-K, Sistolik kan basıncı, sigara (sayı), DM, alan bazlı yoksunluk indeksi, aile hikayesi
QRISK2 (14)	10 yıllık KVO riski	Cinsiyet, yaş, Total-K/HDL-K, Sistolik kan basıncı, sigara, DM, alan bazlı yoksunluk indeksi, aile hikayesi, BKI, antihipertansif tedavi, etnik köken, RA, KBH evre 4-5, AF
Reynolds Risk Score (15,16)	10 yıllık MI, inme, koroner revaskülarizasyon veya kardiyovasküler ölüm	Cinsiyet, yaş, Total-K, HDL-K, Sistolik kan basıncı, hsCRP, sigara, ailede erken MI hikayesi (<60 yaş), DM varsa HbA1c
Globorisk (17)	10 yıllık KVH ölüm riski	Cinsiyet, yaş, Total-K, Sistolik kan basıncı, sigara, DM

AF; Atrial Fbrilasyon, BKI; Beden Kitle İndeksi, DM; Diabetes Mellitus, HDL-K; HDL Kolesterol, hsCRP; Yüksek hassas CRP, HT: Hipertansiyon, KBH; Kronik Böbrek Hastalığı, MI; Miyokard İnfarktüsü, RA;Romatoid Artrit, Total-K; Total Kolesterol,

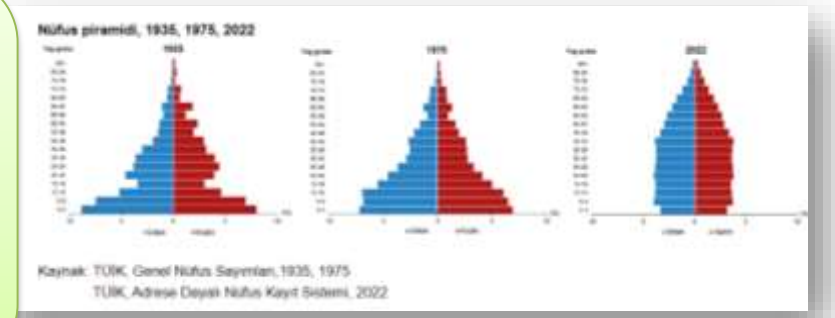
Türkiye’de Yaşlı Nüfusun Zamanla Değişimi



Hastalarımız da yaşlanıyor



2015 yılında % 8,2
2020 yılında % 9,5
2025 yılında % 11
2030 yılında %12,9
2040 yılında % 16,3
2080 yılında % 25,6



Clinical Gastroenterology and Hepatology 2018;16:1189–1196

AGA CLINICAL PRACTICE UPDATE: EXPERT REVIEW

Treatment of Dyslipidemia in Common Liver Diseases

Elizabeth K. Speliotes,* Maya Balakrishnan,‡ Lawrence S. Friedman,§ and Kathleen E. Corey‖

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Table 2. Indications for Pharmacologic Reduction of Serum LDL Levels in the General Population

Presence of clinical atherosclerotic cardiovascular disease (coronary heart disease, symptomatic carotid artery disease, stroke/transient ischemic attack, peripheral artery disease, abdominal aortic aneurysm)
Adults 40–77 years of age with diabetes mellitus and LDL levels of 70–189 mg/dL
Adults 40–75 years of age with a global 10-year risk of cardiovascular disease ≥7.5% and an LDL level of 70–189 mg/dL
Adults with an LDL level ≥190 mg/dL

Adapted from 2013 American Heart Association/American College of Cardiology guidelines.[1]
LDL, low-density lipoproteins.

Tablo 3. ATP III'e göre farklı risk gruplarında LDL kolesterol tedavi hedefleri

ATP III LDL kolesterol hedefleri Risk grubu	LDL kolesterol	Yaşam tarzı değişimi	İlaç tedavisi
Yüksek risk KKH veya eşdeğeri 10-yıl risk>%20	<100 mg/dl (opsiyonel hedef <70 mg/dl)	≥100 mg/dl	≥100 mg/dl (<100 mg/dl ilaç seçeneği)*
Orta derece yüksek risk: 2+ RF 10-yıl risk %10-20	<130 mg/dl	≥130 mg/dl	≥130 mg/dl (100-129 mg/dl; ilaç seçeneği)&
Orta risk: 2+ RF 10-yıl risk: <%10	<130 mg/dl	≥130 mg/dl	≥160 mg/dl
Düşük risk 0-1 risk faktörü	<160 mg/dl	≥ 160 mg/dl	≥ 190 mg/dl (160-189 mg/dl; LDL düşürücü ilaç opsiyonel)

*LDL düşürücü tedavi uygulandığında %30-40 azalma sağlayacak doz yeterli; &Klinik çalışmalar ışığında LDL kolestrolü <100 mg/dl yapmak için ilaç başlanması tercihe bağlıdır.

Tablo 4. Mevcut statinler, başlangıç standart dozlar ve bu dozlar ile ulaşılabilen ortalama LDL düşüşü

İlaç	Doz (mg/dl)	LDL düşüşü (%)
Atorvastatin	10*	39
Lovastatin	40*	31
Pravastatin	40*	34
Simvastatin	20-40*	35-41
Fluvastatin	40-80	25-35
Rosuvastatin	5-10†	39-45

*İlaçların tümünde doz maksimum 80 mg'a dek çıkılabilir. Bu doza ulaşana dek dozun her iki kat artışı ile LDL kolesterolde başlangıç değerinin üzerine %6'lık ek düşüş elde edilir. †Rosuvastatin için FDA tarafından önerilen maksimum doz 40 mg'dır. 5 mg için etkinlik 10 mg dozu ile elde edilen LDL düşüşünden ilave %6 çıkarılarak elde edilmiştir.

Speliotes EK et al. Clin Gastroenterol Hepatol 2018; 16: 1189-96.

Türk Kardiyol Dern Arş - Arch Turk Soc Cardiol 2009;37 Suppl 2:29-36

BMC Gastroenterology

RESEARCH Open Access

Statin use and the risk of hepatocellular carcinoma among patients with chronic hepatitis B: an emulated target trial using longitudinal nationwide population cohort data

Dong Hyun Sinn[1,2†], Danbee Kang[3,4†], Yewan Park[4], Hyunsoo Kim[3], Yun Soo Hong[5], Juhee Cho[3,3,5*] and Geum-Youn Gwak[1*]

Statinler HMGCoA (3 hidroksi 3 metil glutamil CoA) redüktaz inhibitörüdürler
Dislipidemi HSK gelişimi ile doğru orantılı

Statinler hepatotoksik de olabilir 1/100.000 de akut karaciğer yetmezliği

statinler güvenli

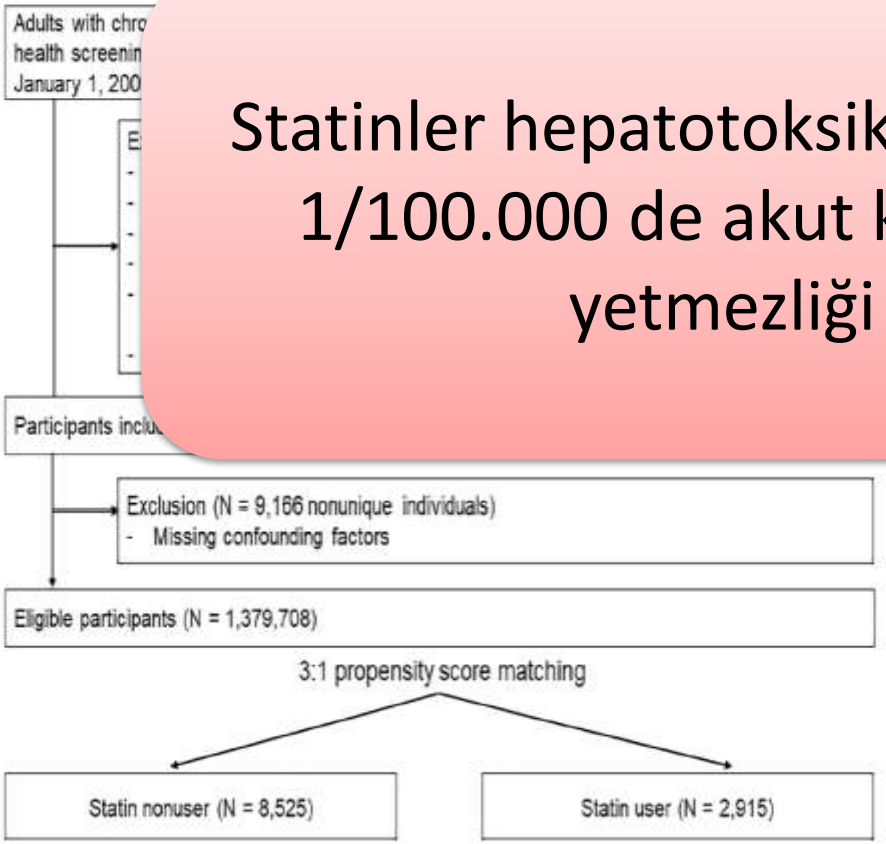
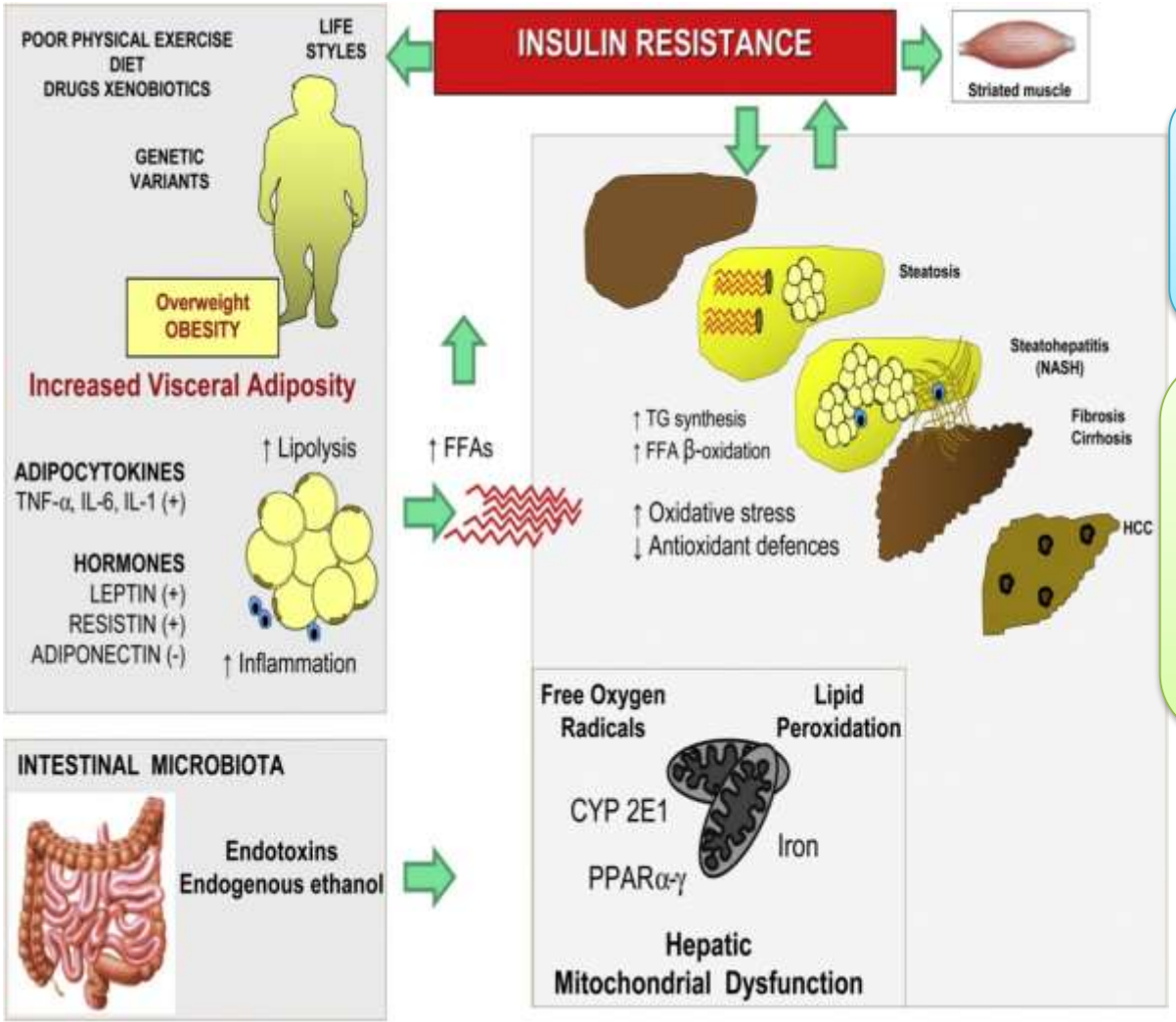


Fig. 1 Flow chart of study subjects. Study participants could have more than one exclusion criteria. *10% random sampling was applied to the statin nonuser group

ios for incidence of hepatocellular carcinoma
ding to statin use

	No of case (100 persons year)	Crude HR (95% CI)	Adjusted HR[a] (95% CI)
	170 (0.3)	Reference	Reference
	37 (0.2)	0.56 (0.39, 0.80)	0.56 (0.39, 0.80)
Liver cancer or liver-related mortality			
Statin nonuser	86 (0.2)	Reference	Reference
Statin user	17 (0.1)	0.57 (0.33, 0.94)	0.59 (0.35, 0.99)
Extrahepatic cancer-related mortality			
Statin nonuser	85 (0.2)	Reference	Reference
Statin user	34 (0.2)	1.13 (0.76, 1.68)	1.12 (0.75, 1.67)
Cardiovascular disease-related mortality			
Statin nonuser	42 (0.1)	Reference	Reference
Statin user	14 (0.1)	0.94 (0.51, 1.72)	0.96 (0.52, 1.79)
All-cause mortality			
Statin nonuser	302 (0.6)	Reference	Reference
Statin user	101 (0.6)	0.94 (0.75, 1.18)	0.93 (0.78, 1.11)

HBV – Lipid Metabolizması arasında bir ilişki var mı?



Karaciğer lipid üretilen organ

Adipositokinlerden Visfatin bakılmış HCV ile anlamlı ilişki varken HBV ile ilişki gösterilmemiş

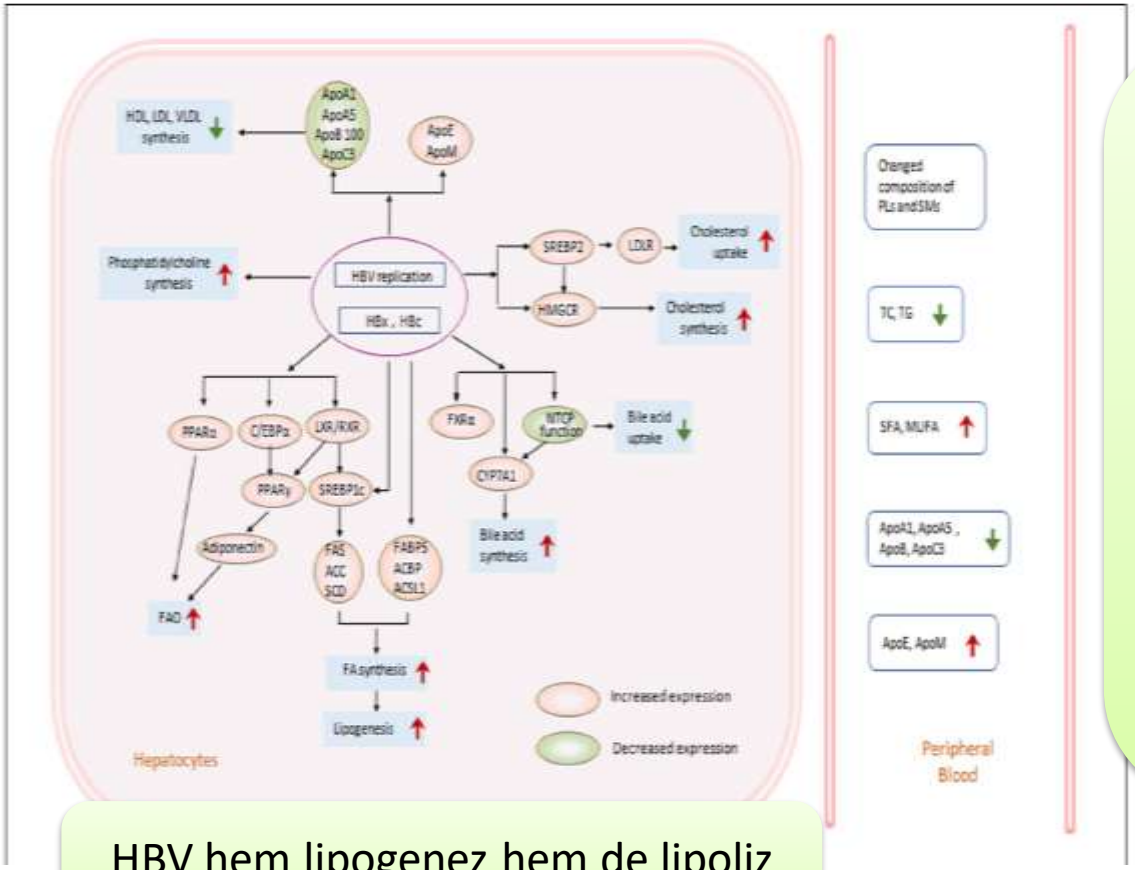
Krawczyk, M et al. Best Prac Research Clin Gastroenterol 2010;24:695-708

frontiers in Microbiology

Multifaceted Interaction Between Hepatitis B Virus Infection and Lipid Metabolism in Hepatocytes: A Potential Target of Antiviral Therapy for Chronic Hepatitis B

HBV ''METABOLİK VİRUS''
METABOLOVIRUS

HBV'nin özellikle HBx proteini



1. LDL R'ünü ve HMGCR (hidroksi metil glutamil koenzim A) redüktaz sentezini arttırır. Kolesterol alımı ve sentezi artar
2. Lipid emilimi için gerekli olan safra asid sentezini arttırır
3. Yağ asit sentezi artar

HBV hem lipogenez hem de lipoliz yapar

Zhang J et al. Frontiers Microbiol 2021; 12: 1-9

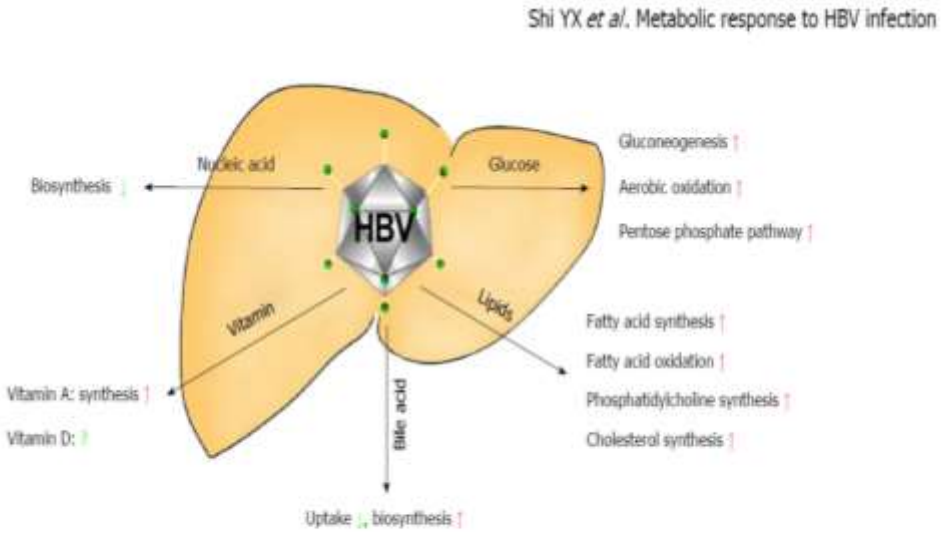


Figure 2 Changes in the hepatic metabolic signaling pathway induced by hepatitis B virus infection. Alterations in related signaling pathways (including glucose, lipids, nucleic acids, bile acids and vitamins) following hepatitis B virus (HBV) infection are marked and highlighted in this figure. The influence of HBV infection on vitamin D metabolism is unclear.

HBx proteini ile lipid sentezi ve hepatosite yağ asit bağlanması artarken apolipoprotein salgılanması engellenir
Böylece periferik kanda Kolesterol ve Trigliserid azalır, LDL, VLDL çok düşer.
Ancak karaciğer yağlanması artar

Original Article

The Evaluation of Serum Lipid Profile in Chronic Hepatitis B Patients at a Tertiary Care Centre in Western India: A Cross-Sectional Study

Durga Shankar Meena, Deepak Kumar, Mahendra Kumar Garg, Mahadev Meena, Bharat Seju, Gopal Krishana Bohra, Naresh Kumar Midha, Mithu Banerjee[1]

Departments of Internal Medicine and [1]Biochemistry, All India Institute of Medical Sciences, Jodhpur, Rajasthan, India

Table 2: Serum lipid profile of the study population compared with healthy control

Lipid profile	HBV positive patients (n=50)	Control (HBV negative, n=43)	CI of mean difference (95%)	P
TC (mg/dL)	133.06±42.35	162.39±28.51	−44.17–−15.03	0.0002
TG (mg/dL)	122.22±53.37	128.42±28.19	−24.43-11.33	NS
HDL-C (mg/dL)	35.56±11.42	43.65±8.20	−11.87–−4.38	0.0002
LDL-C (mg/dL)	76.62±29.04	99.95±24.55	−33.60–−12.85	0.0001
VLDL-C (mg/dL)	24.57±10.85	25.43±5.7	−4.59-2.73	NS

Values are mean±SD. P<0.05 is considered statistically significant, NS: P>0.05 (NS). TC=Total cholesterol, TG=Triglyceride, HDL-C=High-density lipoprotein cholesterol, LDL-C=Low-density lipoprotein cholesterol, VLDL-C=Very LDL-C, HBV=Hepatitis B virus, NS=Not significant, CI=Confidence interval, SD=Standard deviation

Meena DS et al. Ann Afr Med 2022; 21: 316-21.

Taibah University
Journal of Taibah University Medical Sciences

Original Article

Dyslipidemia and impaired liver function biomarkers in patients with hepatitis B liver cirrhosis

Naila Shoaib, M.Phil [a,b], Zaman Khan, Ph.D. [c], Marakh Ibrahim, B.S [c], Anjum Hafeez, B.S [c], Aroog Fatima, B.S [c], Hassan Imran, M.Phil [c], Fiza Saleem, M.Phil [c], Syed Muhammad Hassan Askari, M.Phil [c] and Saira Gull, M.Phil [c,*]

[a] Cancer Research Centre, University of the Punjab, Lahore, Pakistan
[b] Institute of Microbiology and Molecular Genetics, University of the Punjab, Lahore, Pakistan
[c] University Institute of Medical Laboratory Technology, Faculty of Allied Health Sciences, The University of Lahore, Lahore, Pakistan

Received 29 August 2022; revised 14 November 2022; accepted 1 January 2023; Available online 12 January 2023

Table 1: Demographic and clinical features of the study population.

Parameters	Reference Range	Patients (n = 300)	Controls (n = 200)	*P*
Age (years)	–	54.6 ± 13.3	54.3 ± 12.7	0.615
Age group n (%)				
≤20	–	2 (0.7)	2 (1)	0.969
21–40	–	43 (14.3)	29 (14.5)	
41–60	–	162 (54)	112 (56)	
61–80	–	84 (28)	52 (26)	
81–100	–	9 (3)	5 (2.5)	
Sex n (%)				
Male	–	137 (46)	93 (46.5)	0.855
Female	–	163 (54)	107 (53.5)	
LFTs				
Bilirubin	0–1.2 mg/dl	0.7 ± 0.92	0.63 ± 0.34	0.224
AST	10–35 U/L	52.4 ± 123.43	25.4 ± 8.9	<0.001
ALT	9–41 U/L	50.9 ± 70.80	24.2 ± 9.2	<0.001
ALP	30–120 U/L	121.8 ± 87.27	74.8 ± 8.9	<0.001
Lipid profile				
TC	<200 mg/dl	153.7 ± 9.2	190.0 ± 5.6	<0.001
TG	<200 mg/dl	134.8 ± 8.6	145.8 ± 7.3	<0.001
HDL	40–50 mg/dl	22.2 ± 4.4	40.8 ± 6.0	<0.001
LDL	<115 mg/dl	79.6 ± 11.6	101.9 ± 9.6	<0.001
VLDL	~50 mg/dl	29.9 ± 5.8	47.4 ± 4.2	<0.001

Open Forum Infectious Diseases

MAJOR ARTICLE

Atherosclerotic Cardiovascular Disease Risk Profile of Tenofovir Alafenamide Versus Tenofovir Disoproxil Fumarate

Gregory D. Huhn,[1] David J. Shamblaw,[2] Jean-Guy Baril,[3] Priscilla Y. Hsue,[4] Brittany L. Mills,[1] Thai Nguyen-Cleary,[5] Scott McCallister,[6] and Moupali Das[6]

[1]The Ruth M Rothstein CORE Center, Chicago, Illinois, USA, [2]La Playa Medical Group and Clinical Research, San Diego, California, USA, [3]Clinique Medicale Du Quartier Latin, Montreal, Canada, [4]San Francisco General Hospital, San Francisco, California, USA, [5]Gilead Sciences, Foster City, California, USA, [6]Gilead Sciences, Foster City, California USA, [7]Gilead Sciences, Foster City, California, USA, [8]Gilead Sciences, Foster City, California USA

HIV'LE YAŞAYAN HASTALAR

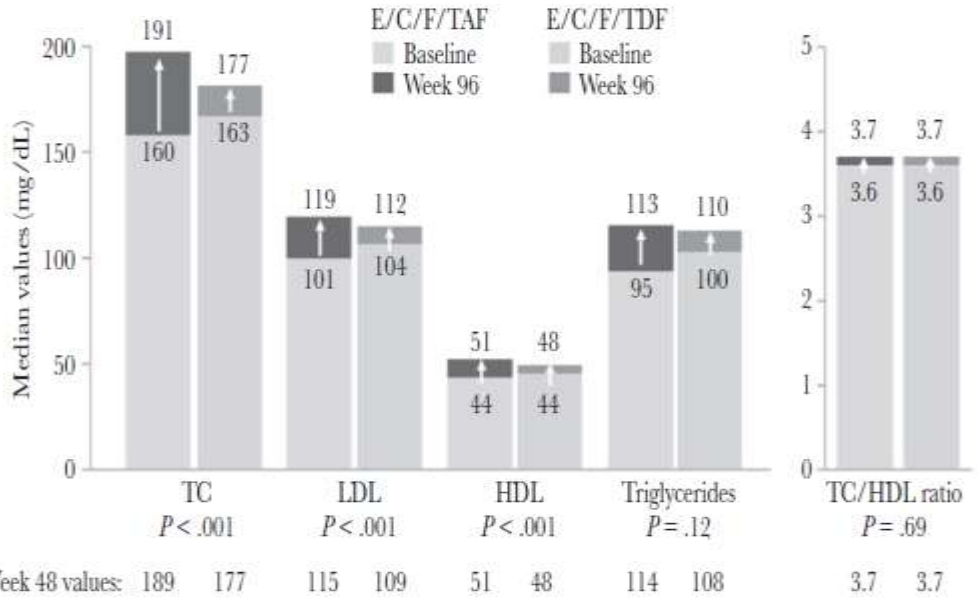


Figure 2. Fasting lipids at baseline and Week 96 results. C, cobicistat; E, elvitegravir; F, emtricitabine; HDL, high-density lipoprotein; LDL, low-density lipoprotein; TAF, tenofovir alafenamide; TC, total cholesterol; TDF, tenofovir disoproxil fumarate.

Original Article

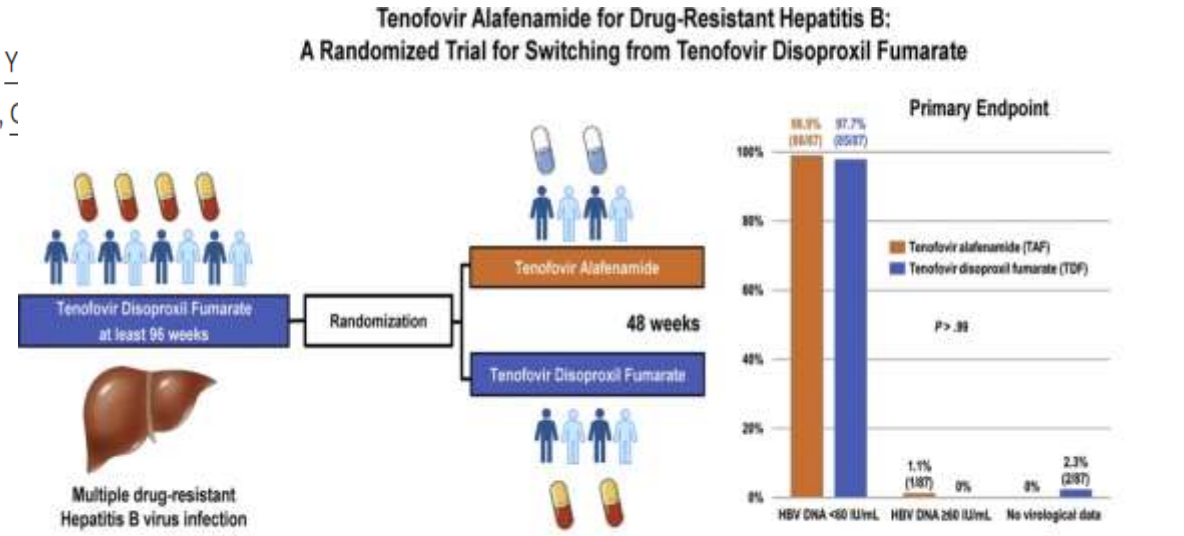
Pancreas, Biliary Tract, and Liver

Tenofovir Alafenamide for Drug-Resistant Hepatitis B: A Randomized Trial for Switching From Tenofovir Disoproxil Fumarate

Kwan Soo Byun [*] [a], Jonggi Choi [‡] [a], Ji-Hoon Kim [*], Y
Yoon Jun Kim [§], Byung Chul Yoo [‖], So Young Kwon [‖], C
Young-Suk Lim [‡]

Show more

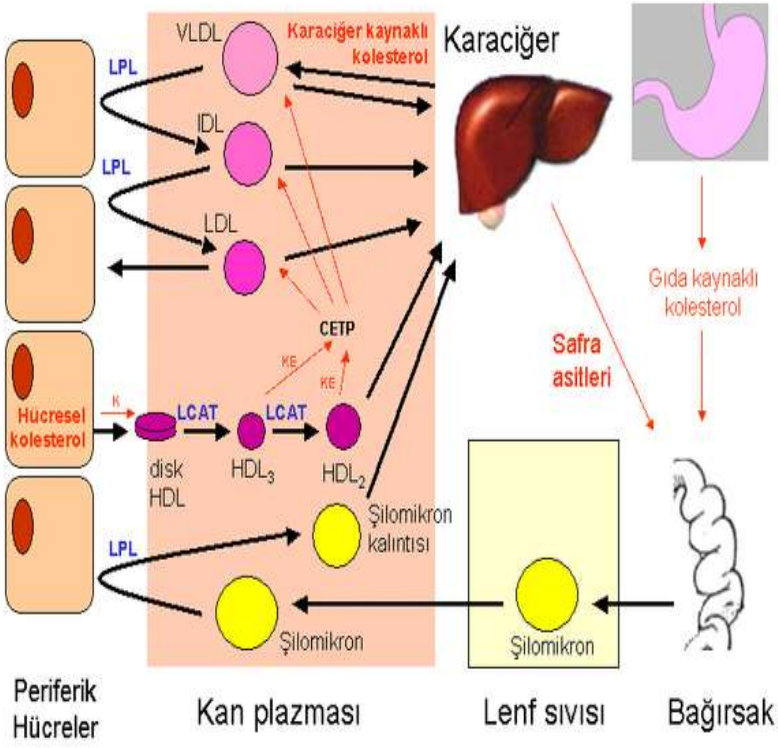
84 TAF/80 TDF 48 hafta takip etkilik açısından fark yok
TAF alanlarda LDL belirgin yüksek/ kilo alımı TAF kanadında daha fazla



Conclusions

TAF could be substituted for TDF in patients with multidrug-resistant HBV for improved bone and renal safety without a loss of efficacy. However, increases in body weight and cholesterol levels with TAF treatment would be a concern. ClinicalTrials.gov = no.: NCT03241641.

*ClinGastroenterol Hepatology.*2022;20:427–37



69 hastadan 33'ü TDF'den TAF'a geçilmiş.
TAF kolunda LDL belirgin yüksek bulunmuş

PLOS ONE

RESEARCH ARTICLE

Effect of switching from tenofovir disoproxil fumarate to tenofovir alafenamide on lipid profiles in patients with hepatitis B

Kazuharu Suzuki[1,2*], Goki Suda[1*], Yoshiya Yamamoto[2], Satoshi Abiko[2], Kenji Kinoshita[2], Shuichi Miyamoto[2], Ryo Sugiura[2], Megumi Kimura[2], Osamu Maehara[1]

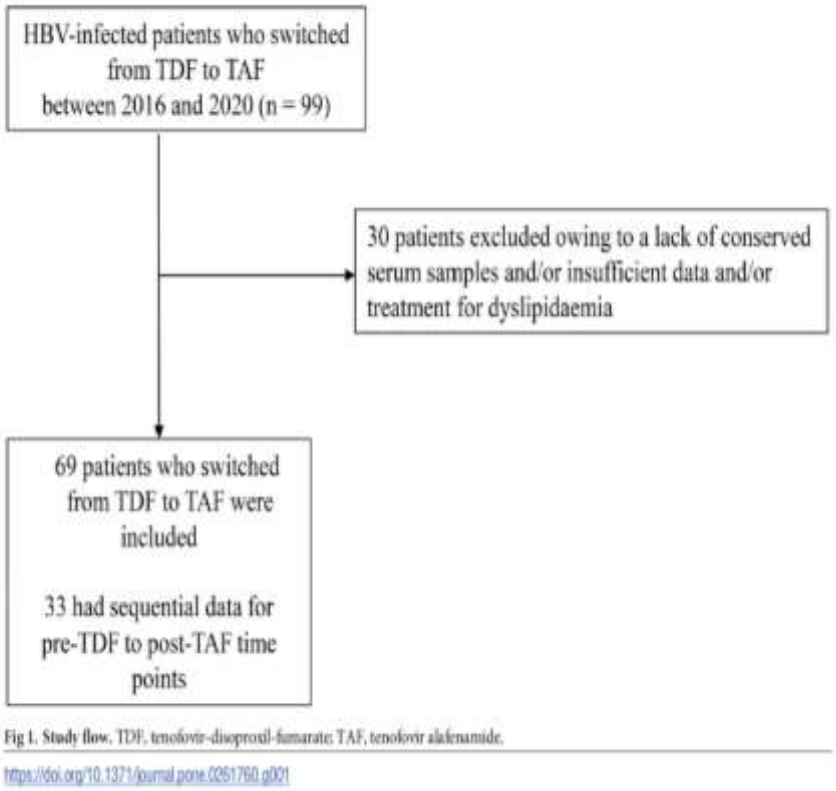
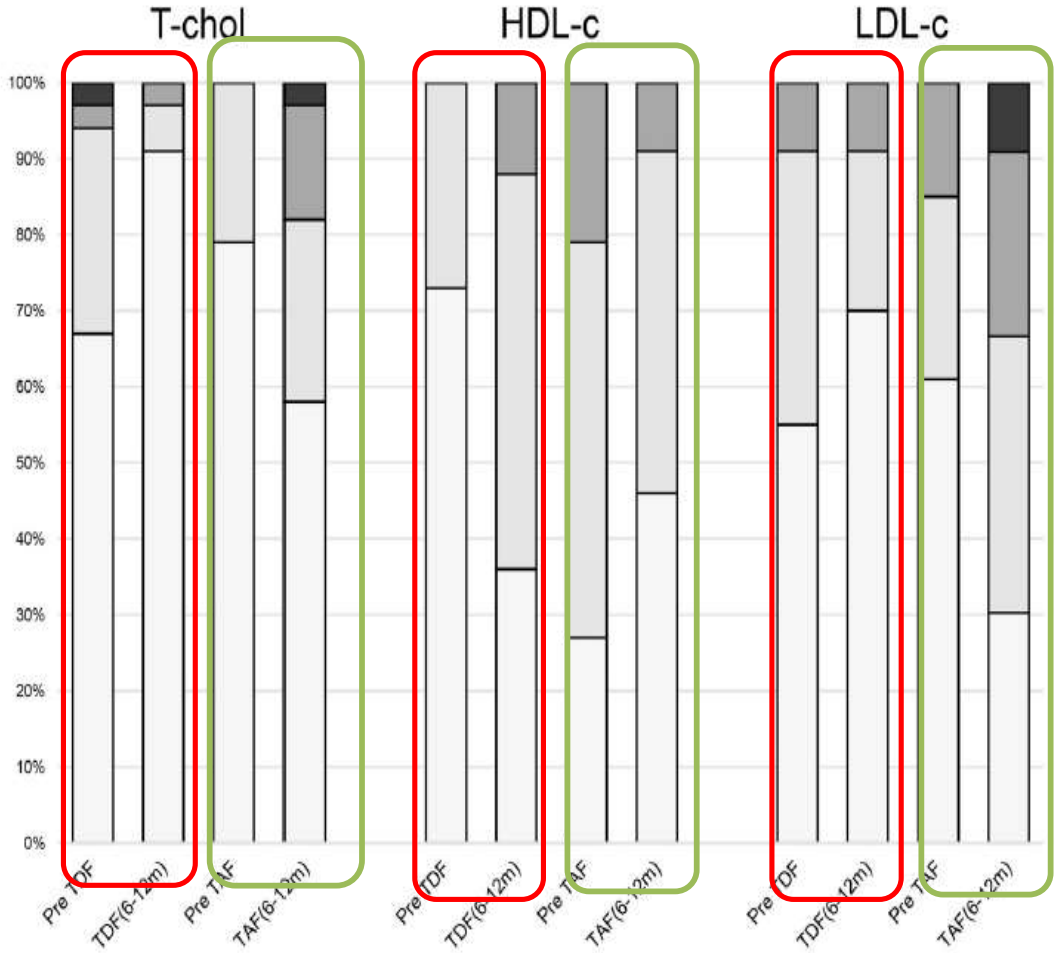


Fig 1. Study flow. TDF, tenofovir-disoproxil-fumarate; TAF, tenofovir alafenamide.

https://doi.org/10.1371/journal.pone.0261760.g001

Suzuki K et al. Plos One 2022; 17 (1): e1-17

B



	Pre TDF	TDF(6-12m)	Pre TAF	TAF(6-12m)		Pre TDF	TDF(6-12m)	Pre TAF	TAF(6-12m)		Pre TDF	TDF(6-12m)	Pre TAF	TAF(6-12m)
■ Severe dyslipidaemia	3.0%	0.0%	0.0%	3.0%		N/A	N/A	N/A	N/A		0.0%	0.0%	0.0%	9.1%
■ Dyslipidaemia	3.0%	3.0%	0.0%	15.2%		0.0%	12.1%	21.2%	9.1%		9.1%	9.1%	15.2%	24.2%
□ Borderline	27.3%	6.1%	21.2%	24.2%		27.3%	51.5%	51.5%	45.5%		36.4%	21.2%	24.2%	36.4%
□ Optimal	66.7%	90.9%	78.8%	57.6%		72.7%	36.4%	27.3%	45.5%		54.5%	69.7%	60.6%	30.3%

P=0.089 P=

Suzuki K et al. Plos One 2022; 17 (1): e1-17

Original Article

Changes in blood lipids in patients with chronic hepatitis B after 48 weeks of tenofovir alafenamide treatment: A prospective real-world clinical study

Antiviral Therapy
April 2022: 1–8

DOI: 10.1177/13596353221082399
journals.sagepub.com/home/vet
SAGE

Yeqiong Zhang#, Zhipeng Li#, Qiumin Luo#, Wenxiong Xu, Lu Wang, Shu Zhu, Liang Peng* and Chan Xie*

Department of Infectious Diseases, Third Affiliated Hospital of Sun Yat-Sen University, Guangzhou, China

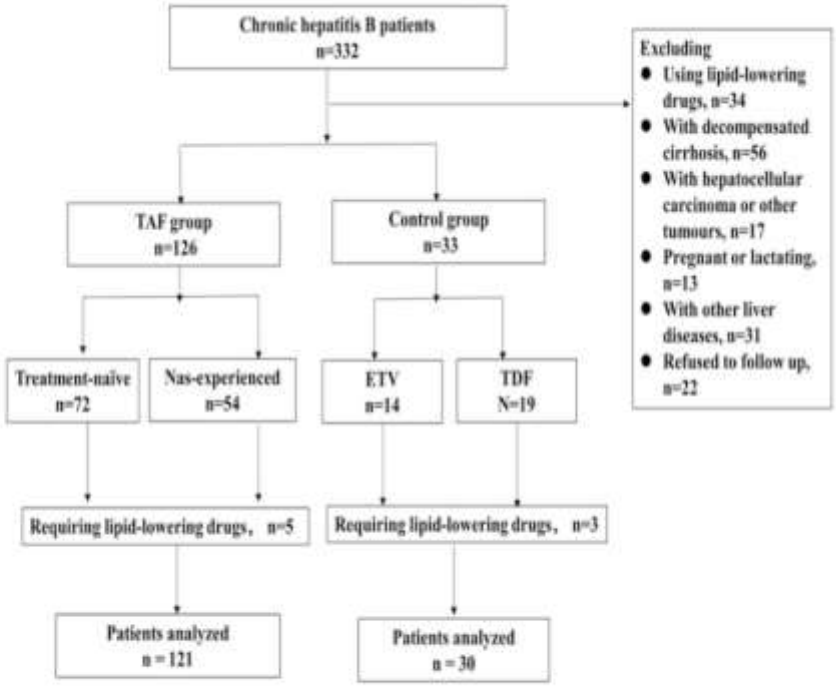


Figure 1. Flow chart of patient inclusion

Zhang Y et al 2022; 1-8

Table 3. Changes in blood lipid levels from baseline to 48 weeks of TAF treatment in patients who received ETV or TDF before TAF

	ETV	*p*	TDF	*p*
△ proportion with TC abnormality (%)	7.6	1.000	13.1	0.375
△ proportion with TG abnormality (%)	36.7	0.063	17.4	0.219
△ proportion with LDL-C abnormality (%)	−6.7	1.000	−8.7	0.500
△ TC (mmol/L, median [IQR])	0.04 (−0.49.0.52)	0.248	0.28 (−0.37.0.39)	0.242
△ TGs (mmol/L, median [IQR])	0.24 (−0.18.0.74)	0.203	0.19 (−0.11.0.47)	0.1201
△ LDL-C (mmol/L, median [IQR])	−0.15 (−0.30.0.22)	0.629	0.11 (−0.26.0.23)	0.891

TC: total cholesterol; LDL-C: low-density lipoprotein cholesterol; TGs: triglycerides.

Table 4. Analysis of risk factors related to total cholesterol and triglycerides abnormalities after 48 weeks of TAF treatment

	TC			TGs		
	OR	95% CI	*p*	OR	95% CI	*p*
Age	1.02	0.95–1.09	0.690	0.98	0.92–1.05	0.534
Sex: Female*						
Male	0.92	0.18–4.65	0.916	3.21	0.30–34.18	0.333
BMI	0.69	0.51–0.94	0.018	1.09	0.91–1.32	0.355
Smoking	0.46	0.06–3.25	0.434	3.50	1.01–12.13	0.048
Baseline TC/TGs	12.48	3.90–40.01	0.000	5.90	2.34–14.92	0.000
Cardiovascular disease risk						
Low to moderate*						
High	2.6	0.47–14.31	0.271	1.39	0.37–5.23	0.629

*represents the control.
BMI: body mass index; TC: total cholesterol; TGs: triglycerides.

Zhang Y et al 2022; 1-8

Table 2. Changes in blood lipid levels after TAF treatment (mmol/L, median [IQR])

	Baseline	Week 48	Change from baseline	p*
TAF group				
TC	4.82 (4.29.5.60)	5.00 (4.43.5.80)	0.23 (-0.27, 0.61)	0.014
LDL-C	3.31 (2.71.3.75)	3.17 (2.74.3.67)	0.01 (-0.29, 0.29)	0.750
TGs	1.12 (0.82.1.45)	1.25 (0.89.1.87)	0.13 (-0.15.0.48)	0.004
Body weight	66.0 (60.0.75.0)	66.3 (60.0.73.9)	0 (-1.0.1.0)	0.833
Control group				
TC	4.69 (3.81.5.20)	4.39 (3.89.5.32)	−0.20 (-0.48.0.26)	0.552
LDL-C	3.07 (2.46.3.62)	2.86 (2.32.3.39)	−0.15 (-0.35, 0.19)	0.371
TGs	1.07 (0.74.1.29)	0.96 (0.62.1.52)	−0.06 (-0.32.0.26)	0.723
Body weight	63.3 (57.9.75.0)	62.3 (59.0.75.8)	0 (-0.9.1.0)	0.592
p				
TC	0.123	0.010	0.037	
LDL-C	0.175	0.039	0.242	—
TGs	0.488	0.024	0.032	—
Body weight	0.478	0.381	0.621	—

p: Independent sample T test or Wilcoxon signed rank sum test was used to compared with the control group; p*: Paired sample T test was used compare baseline and week 48 of each group.
TC: total cholesterol; LDL-C: low-density lipoprotein cholesterol; TGs: triglycerides.

Kontrol Grup: TDF/ETV

Zhang Y et al 2022; 1-8

World Journal of Hepatology

Submit a Manuscript: https://www.wjgnet.com

World J Hepatol 2023 August 27; 15(8): 964-972

DOI: 10.4254/wjh.v15.i8.964

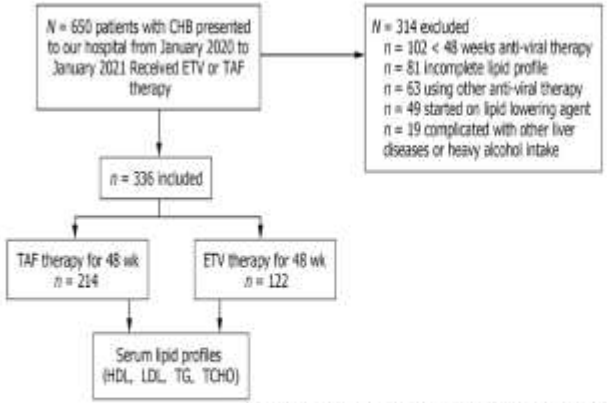
ISSN 1948-5182 (online)

ORIGINAL ARTICLE

Retrospective Cohort Study

Tenofovir alafenamide significantly increased serum lipid levels compared with entecavir therapy in chronic hepatitis B virus patients

Rui-Min Lai, Shan Lin, Miao-Miao Wang, Na Li, Jia-Hui Zhou, Xiao-Yu Lin, Tian-Bin Chen, Yue-Yong Zhu, Qi Zheng



DOI: 10.4254/wjh.v15.i8.964

Figure 1 Flowchart of study participants. CHB: Chronic hepatitis B; TAF: Tenofovir alafenamide; ETV: Entecavir; TCHO: Total cholesterol; HDL: High density lipoprotein; LDL: Low-density lipoprotein; TG: Triglycerides.

Table 1 Summary of demographic and clinical characteristics at baseline of chronic hepatitis B patients on tenofovir alafenamide or entecavir therapy

Characteristic	TAF, *n* = 214	ETV, *n* = 122	*P* value
Age in yr	43.38 ± 10.42	49.96 ± 11.82	0.001
Male	158 (73.83)	96 (78.69)	0.387
BMI in kg/m^2	22.97 ± 2.93	23.78 ± 3.30	0.152
Smoking	16 (7.48)	15 (12.30)	0.203
Drinking	13 (6.07)	14 (11.48)	0.123
ALT in U/L	36.60 ± 36.87	30.44 ± 20.00	0.089
AST in U/L	28.01 ± 26.41	24.50 ± 13.58	0.172
logHBsAg in ng/mL	3.07 ± 0.92	3.04 ± 0.84	0.787
logDNA in IU/mL	1.94 ± 1.23	1.86 ± 1.05	0.56
CREA in μmol/L	73.68 ± 15.87	74.82 ± 16.78	0.535
UA in μmol/L	353.52 ± 89.10	357.23 ± 84.29	0.708
GFR in mL/min	103.48 ± 15.01	97.86 ± 14.17	0.001
CK in U/L	157.23 ± 444.75	122.91 ± 71.31	0.401
FBG in mmol/L	5.18 ± 0.80	5.52 ± 1.61	0.011
Concurrent diseases			
Hypertension	17 (7.94)	21 (17.21)	0.016
DM	20 (9.35)	13 (10.66)	0.844
NAFLD	75 (35.05)	32 (26.23)	0.122
Cirrhosis	54 (25.23)	50 (40.98)	0.004

Data are presented as *n* (%). ALT: Alanine aminotransferase; AST: Aspartate aminotransferase; BMI: Body mass index; CK: Creatine kinase; CREA: Creatinine; DM: Diabetes mellitus; ETV: Entecavir; FBG: Fasting blood-glucose; GFR: Glomerular filtration rate; HBsAg: Hepatitis B surface antigen; NAFLD: nonalcoholic fatty liver disease; TAF: Tenofovir alafenamide; UA: Uric acid.

Lai RM et al. World J Hepatol 2023; 15 (8): 964-72.

TAF ve ETV alan hastalar
1 yıl sonunda TAF kolunda belirgin T kolesterol artışı olmuş

Table 3 Impact of tenofovir alafenamide on achieving a higher level of total cholesterol in chronic hepatitis B patients

Characteristic	TCHO, increased change (%) by using TAF compared with ETV[1,2], OR (95%CI)	*P* value
5% higher than baseline	1.88 (1.11, 3.16)	0.019
10% higher than baseline	1.70 (0.94, 3.09)	0.081
15% higher than baseline	2.07 (0.99, 4.34)	0.055

Lai RM et al. World J Hepatol 2023; 15 (8): 964-72.

Received: 28 March 2022 | First decision: 13 April 2022 | Accepted: 13 June 2022
DOI: 10.1111/apt.17187

APT Alimentary Pharmacology & Therapeutics WILEY

Switching to tenofovir alafenamide for nucleos(t)ide analogue-experienced patients with chronic hepatitis B: week 144 results from a real-world, multi-centre cohort study

Eiichi Ogawa[1] | Makoto Nakamuta[2] | Toshimasa Koyanagi[3] | Aritsune Ooho[4] | Norihiro Furusyo[5] | Eiji Kajiwara[6] | Kazufumi Dohmen[7] | Akira Kawano[8] |

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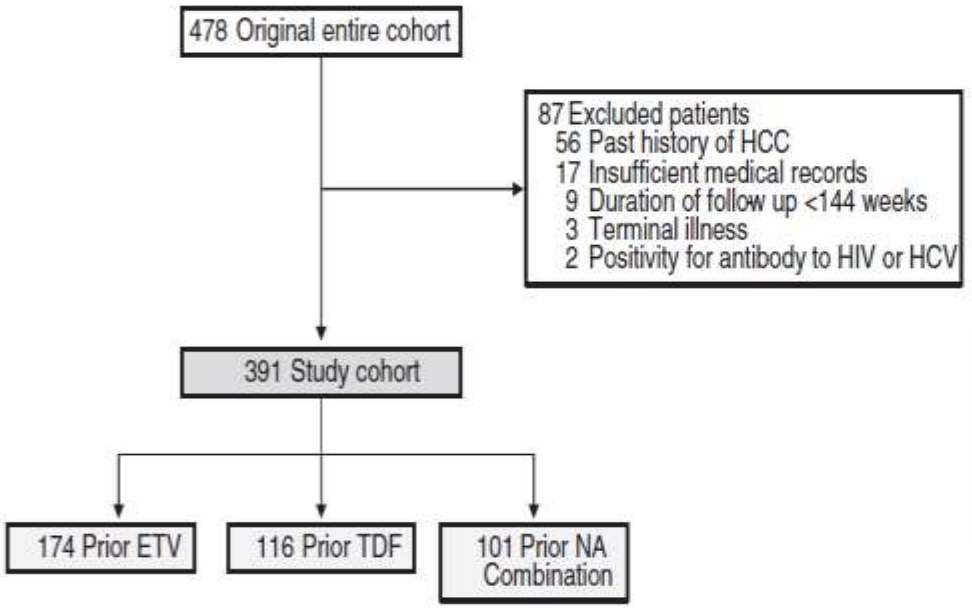
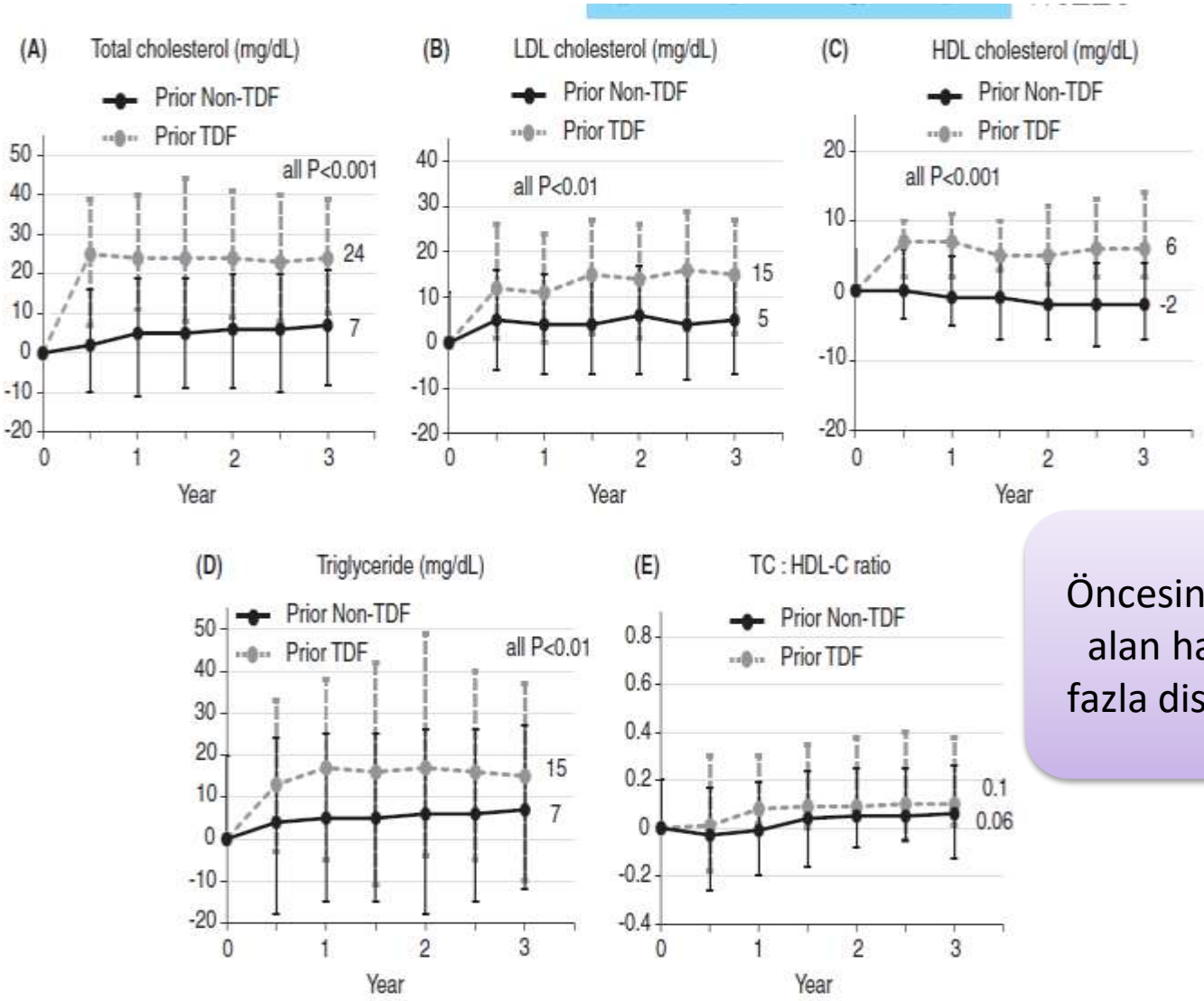


FIGURE 1 Study flow chart. ETV, entecavir; HCC, hepatocellular carcinoma; HCV, hepatitis C virus; HIV, human immunodeficiency virus; NA, nucleos(t)ide analogue; TDF, tenofovir disoproxil fumarate.

Neden TDF kullanan hastalarda dislipidemi daha az ya da bazal değerlerden daha iyi

Ogawa E et al Aliment Pharmacol Ther 2022; 56: 713-22.



Öncesinde TDF tedavisi alan hastalarda daha fazla dislipidemi oluyor

FIGURE 3 Longitudinal change in (A) total cholesterol, (B) LDL cholesterol, (C) HDL-cholesterol, (D) triglyceride and (E) total cholesterol/HDL cholesterol ratio over the 144 weeks after switching to TAF. Bars are expressed as median change from baseline (first-third quartile). HDL, high-density lipoprotein; LDL, low-density lipoprotein; TAF, tenofovir alafenamide.

Ogawa E et al Aliment Pharmacol Ther 2022; 56: 713-22.

Risk of dyslipidemia in chronic hepatitis B patients taking tenofovir alafenamide: a systematic review and meta-analysis

Original Article | Published: 26 April 2023

Volume 17, pages 860–869, (2023) Cite this article

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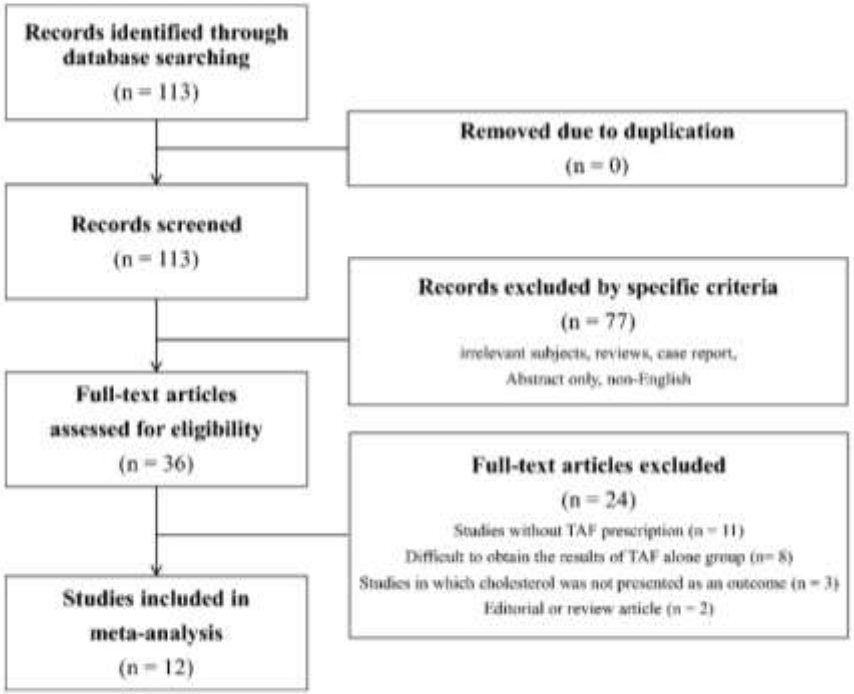
Fig. 1

From: Risk of dyslipidemia in chronic hepatitis B patients taking tenofovir alafenamide: a systematic review and meta-analysis



Flow charts of the study

Table 2 Change in lipid profile during TAF treatment (vs. baseline)

From: Risk of dyslipidemia in chronic hepatitis B patients taking tenofovir alafenamide: a systematic review and meta-analysis

Outcome		No. of studies	Mean difference	95% CI	I^2	*p* for heterogeneity
HDL-cholesterol	6 months	5	2.61	0.38 to 4.84	45	0.12
	12 months	4	2.49	−4.55 to 9.53	100	< 0.01
	24 months	3	-0.57	−7.98 to 6.84	95	< 0.01
LDL-cholesterol	6 months	6	5.69	1.82 to 9.55	83	< 0.01
	12 months	4	7.10	0.65 to 13.55	99	< 0.01
	24 months	3	5.52	−1.46 to 12.50	82	< 0.01
Total cholesterol	6 months	7	7.89	4.92 to 10.86	59	0.02
	12 months	6	7.97	−2.70 to 18.64	100	< 0.01
	24 months	3	2.60	−3.55 to 8.74	82	< 0.01
Triglyceride	6 months	6	9.25	1.52 to 16.98	99	< 0.01
	12 months	4	13.80	2.91 to 24.69	100	< 0.01
	24 months	4	14.94	5.87 to 24.00	100	< 0.01

TAF Tenofovir Alafenamide Fumarate; *HDL-cholesterol* High-Density Lipoprotein cholesterol; *LDL-cholesterol* Low-Density Lipoprotein cholesterol

Table 3 Change in lipid profile during TAF treatment (vs. other NAs)

From: Risk of dyslipidemia in chronic hepatitis B patients taking tenofovir alafenamide: a systematic review and meta-analysis

Outcome		No. of studies	Mean difference	95% CI	I^2	*p* for heterogeneity
HDL-cholesterol	6 months	3	10.28	5.40 to 15.15	100	< 0.01
	12 months	3	6.50	6.22 to 6.77	99	< 0.01
	24 months	2	8.54	3.54 to 13.54	100	< 0.01
LDL-cholesterol	6 months	4	8.71	5.77 to 11.66	99	< 0.01
	12 months	3	9.21	7.24 to 11.18	100	< 0.01
	24 months	2	8.81	− 5.29 to 22.91	100	< 0.01
Total cholesterol	6 months	5	18.34	14.70 to 21.98	100	< 0.01
	12 months	5	16.28	11.82 to 20.75	100	< 0.01
	24 months	2	16.04	2.38 to 29.69	100	< 0.01
Triglyceride	6 months	3	13.68	7.63 to 19.73	99	< 0.01
	12 months	2	13.23	12.67 to 13.79	80	0.03
	24 months	2	14.25	12.64 to 15.86	91	< 0.01

TAF Tenofovir Alafenamide Fumarate; *NA* nucleoside analog; *HDL-cholesterol* High-Density Lipoprotein cholesterol; *LDL-cholesterol* Low-Density Lipoprotein cholesterol

Table 4 Change in lipid profile during TAF treatment (vs. TDF only)

From: Risk of dyslipidemia in chronic hepatitis B patients taking tenofovir alafenamide: a systematic review and meta-analysis

Outcome	No. of studies	Mean difference	95% CI	I^2	*p* for heterogeneity
HDL-cholesterol	4	7.93	7.44 to 8.42	99	< 0.01
LDL-cholesterol	4	14.52	10.95 to 18.10	100	< 0.01
Total cholesterol	5	23.72	19.12 to 28.33	100	< 0.01
Triglyceride	2	14.25	12.64 to 15.86	91	< 0.01

TAF Tenofovir Alafenamide Fumarate; *TDF* Tenofovir Disoproxil Fumarate; *HDL-cholesterol* High-Density Lipoprotein cholesterol; *LDL-cholesterol* Low-Density Lipoprotein cholesterol

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RESEARCH ARTICLE | Open Access

Metabolic effects and cardiovascular disease risks of antiviral treatments in patients with chronic hepatitis B

Hyunjae Shin, Gyung Sun Lim, Jae Woong Yoon, Yunmi Ko, Youngsu Park, Jeayeon Park, Moon Haeng Hur, Min Kyung Park, Yuri Cho, Yun Bin Lee, Eun Ju Cho, Bo Hyun Kim, Jeong-Hoon Lee ... See all authors

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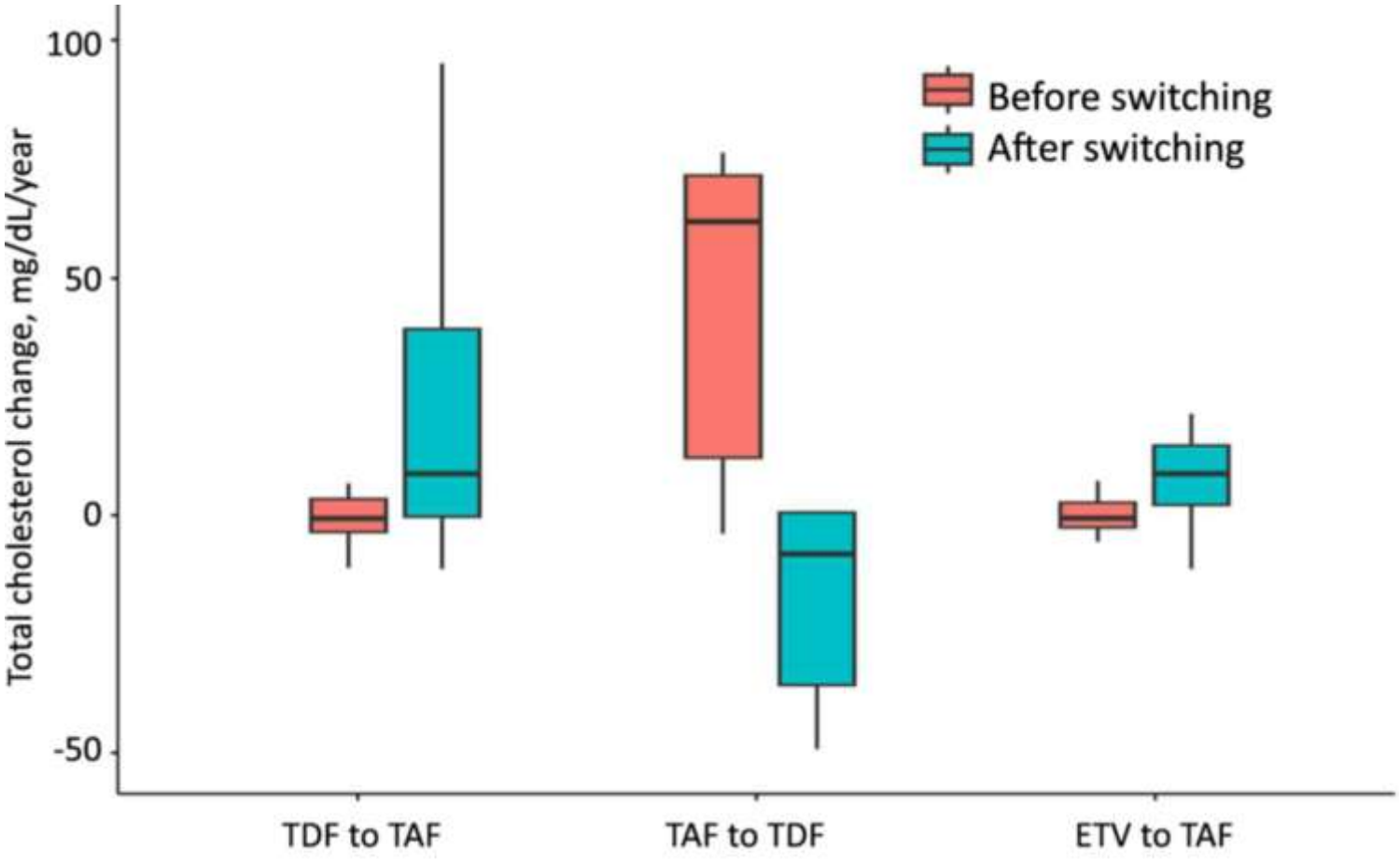

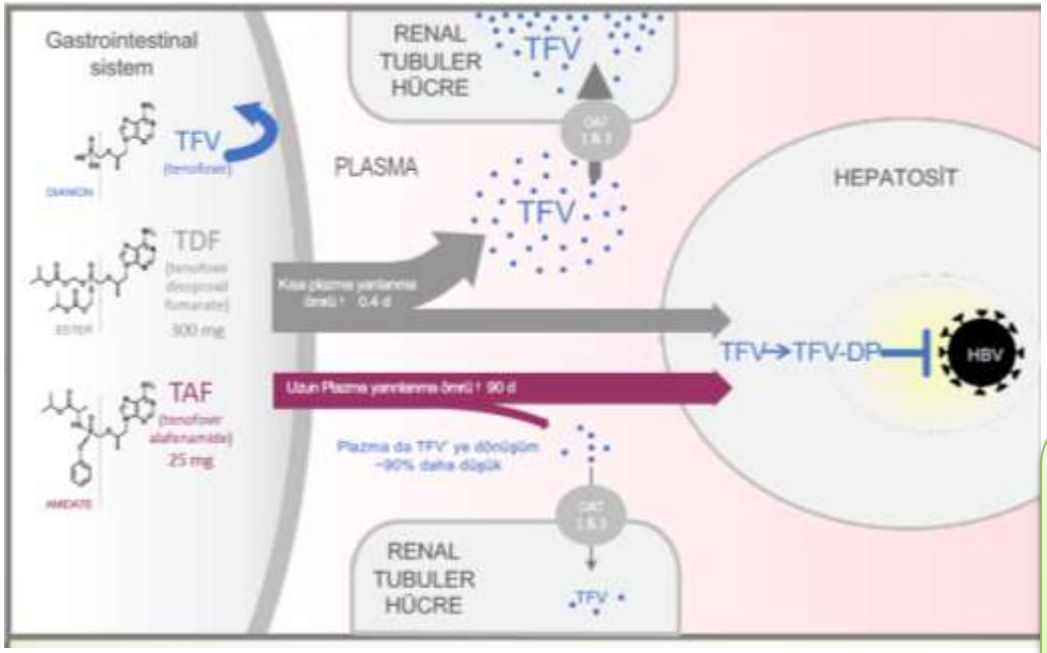

TDF tübüler sekresyon ve GF ile atılır
TAF hücre içi konsantrasyonu fazla
Her ikisi de aktif madde olan Tenofovir difosfata çevrilir

TDF ve TAF arasındaki fark nedir?????
Neden TDF'de lipid profili bozulmuyor?
Neden TAF 'ta dislipidemi var

TDF 'de lipid metabolizmasında ters orantı var
TAF 25 mg/TDF 300 mg

Göreceli????
Daha çok çalışma yapılmalı

Sax P et al. Lancet 2015; 385: 2606-15

Therapeutic Advances in Infectious Disease

Long-term efficacy and s
ides analogues in patients with chronic
hepatitis B

böbrek

kemik

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gebelik

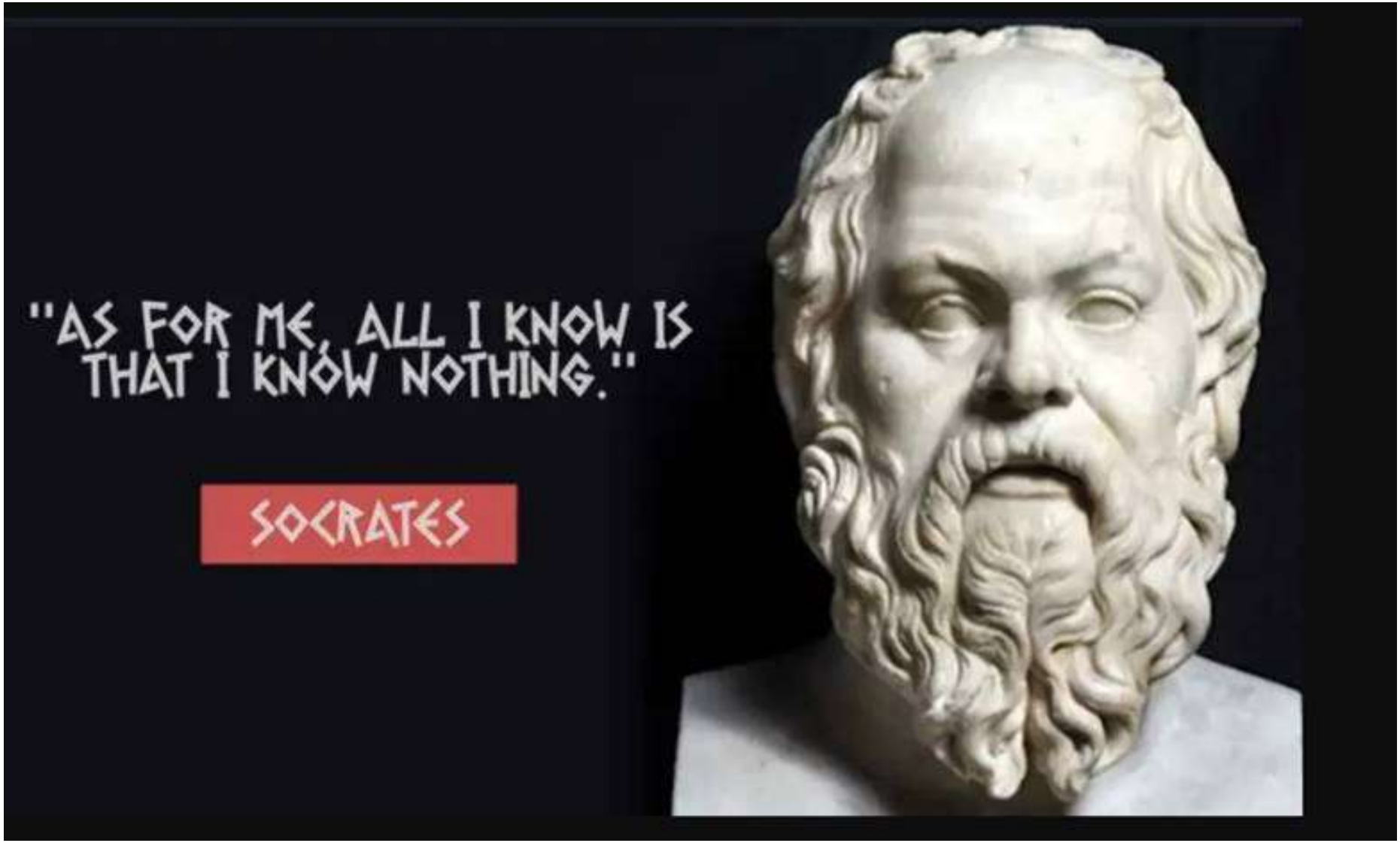
>2 yaş

HIV koenfeksiyon

HDV koenfeksiyonu

Table 1. Monitoring recommendations and considerations for first line NAs.

	TDF	TAF	ETV
	Monitor with serum creatinine, eGFR and serum P^+ at start and then regularly. Dose adjustment if eGFR <50 ml/min per 1.73 m^2. Consider switch to TAF or ETV if P^+ <2.5 mmol/dl, eGFR <60 ml/min per 1.73 m^2 or elderly.[70]	No monitoring needed. No dose adjustment needed. Scarce evidence in hemodialysis and eGFR <15 ml/min per 1.73 m2. Favorable preliminary data.[71,72]	Monitor with serum creatinine and eGFR at start and then regularly. Dose adjustment if eGFR <50 ml/min per 1.73 m^2.
	Consider switch to TAF or ETV if P^+ <2.5 mmol/dl, concomitant bone condition or elderly.	No monitoring needed.	No monitoring needed.
	Usual dose. Extreme kidney monitoring.	Scarce evidence. Favorable preliminary data.[73]	Increase usual dose to 1 mg/day. Extreme kidney monitoring.
	Extremely infrequent. Ensure adherence. Switch to ETV or combination therapy.	Not reported.	Resistance in 1% in naïve, 50% LMV-experienced. Ensure adherence. Switch to TDF usual dose in monotherapy.
	Recommended.	Scarce evidence. Limited favorable data in HIV mono-infected women.[74]	Not recommended.
	Above 2 years old.	Scarce experience, above 12 years old.	Above 2 years old.
	As part of HAART.	As part of HAART.	Not recommended in monotherapy.
	No direct anti-HDV activity.[75] Might be added to peg-IFNα and/or new therapies according to HBV replication.[76]	No direct anti-HDV activity. Data extrapolated from other NAs.[75] Might be added to peg-IFNα and/ or new therapies according to HBV replication.[76]	No direct anti-HDV activity.[75] Might be added to peg-IFNα and/ or new therapies according to HBV replication.[76]



Teşekkürler

- TDF alanlarda
- İlk yıl 3 ayda bir eGFR ve fosfat takibi
- Sonra normal ise 6 ayda bir
- eGFR<60 ml/dk/1,73 m2 ve fosfat <2,5 mg/dL ise yakın takip
- Ya da tedavi değişikliği düşünülmeli

Tedavi takibi nasıl olmalı?

- ALT/AST
  - İlk yıl 3-4 ayda bir
  - Sonraki yıllar, 6 ayda bir
- HBV DNA
  - İlk yıl; DNA negatif oluncaya kadar her ay
  - Sonraki yıllar 6-12 ayda bir
- HBsAg
  - HBV DNA negatifleştiyse 12 ayda bir
- AntiHBs
  - HBs Ag negatifleştikten sob-nra yılda bir
- Kemik ölçümü
  - Yaşa göre yılda bir
- HSK
  - 6-12 ayda bir USG, AFP

Takip (yok et)

Tenofovir

- Serum (3-6 ay)
  - Üre/kr
  - Fosfat
  - Kalsiyum
  - 25 OH D3
  - PTH
  - Ürik asit
- İdrar (1-3-6 ay)
  - Kreatin klirensi
  - Fosfat
  - Protein
  - Glukoz

Entekavir

- Serum (3-6 ay)
  - Üre/kr
  - ALT
  - Bil
  - Amilaz/lipaz
  - CK
  - PLT
  - TG