Hepatit Delta

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Diyarbakır

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Pathogenesis of and New Therapies for Hepatitis D

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Abstract

Hepatitis delta virus (HDV) infection of humans was first reported in 1977, and now it is now estimated that 15–20 million people are infected worldwide. Infection with HDV can be an acute or chronic process that occurs only in patients with an HBV infection. Chronic HDV infection commonly results in the most rapidly progressive form of viral hepatitis; it is the chronic viral infection that is most likely to lead to cirrhosis, and it is associated with an increased risk of hepatocellular carcinoma. HDV infection is the only chronic human hepatitis virus infection without a therapy approved by the Food and Drug Administration. Peginterferon alpha is the only recommended therapy, but it produces unsatisfactory results. We review therapeutic agents in development, designed to disrupt the HDV life cycle, that might benefit patients with this devastating disease.

Hepatlogy 2020

Hepatit Delta Virüs Enfeksiyonu Epidemiyolojisinde Değişim ve Ülkemizdeki Güncel Durum

The Change in Epidemiological Pattern of Hepatitis Delta Virus İnfection and the Current Stiuation in our Country

Selma TOSUN

Manisa Devlet Hastanesi, Enfeksiyon Hastalıkları ve Klinik Mikrobiyoloji Bölümü, Manisa, Türkiye

ÖZET

Hepatitis delta virus (HDV) enfeksiyonu önemli viral enfeksiyonlar arasında yer almaktadır. Defektif bir virüs olan HDV sadece hepatit B virüs (HBV) varlığında enfeksiyona yol açabilmektedir. Dünyada yaklaşık 15 milyon kişinin HDV ve HBV ile koenfekte olduğu bilinmektedir. Dünya genelinde HDV prevalansı bazı endemik bölgelerde azalmakla birlikte göçler nedeniyle kuzey ve orta Avrupa'da artış göstermektedir. Ülkemizde de son yıllarda HDV prevalansında azalma görülmekle birlikte Güneydoğu Anadolu bölgesinde ve düşük sosyoekonomik düzeydeki bölgelerde halen sorun olmaya devam etmektedir. Bu derlemede delta virüs enfeksiyonu ve son yıllarda ülkemizdeki prevalans değişikliği gözden geçirilmiştir. *(Viral Hepatit Dergisi 2013; 19(1): 1-7)*

Anahtar Kelimeler: HDV enfeksiyonu, prevalans

ABSTRACT

Hepatitis delta virus (HDV) infection is one of the important viral infectious diseases. HDV is a defective RNA virus that can infect only individuals who have hepatitis B virus (HBV). It is known that more than 15 million people are co-infected with HDV and HBV worldwide.The prevalence of HDV is declining in some endemic areas but increasing in northern and central Europe because of immigration. Despite the decrease of its prevalence in Turkey, delta hepatitis remains a significant health problem in parts of the country (especially southeastern of Turkey) with low socio-economic level. In this review, HDV infection and its prevalence in Turkey are evaluated. *(Viral Hepatitis Journal 2013; 19(1): 1-7)*

Key words: HDV infection, prevalence

HDV seroprelansı %5

Research article JHEP|Reports

Molecular epidemiology and clinical characteristics of hepatitis D virus infection in Canada

Carla Osiowy,[1,2,*] Ken Swidinsky,[1] Sarah Haylock-Jacobs,[3] Matthew D. Sadler,[3] Scott Fung,[4] David Wong,[4] Gerald Y. Minuk,[2] Karen E. Doucette,[5] Philip Wong,[6] Edward Tam,[7] Curtis Cooper,[8] Alnoor Ramji,[9] Mang Ma,[5] Carmine Nudo,[10] Keith Tsoi,[11] Carla S. Coffin[3]

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JHEP Reports **2022.** https://doi.org/10.1016/j.jhepr.2022.100461

Background & Aims: HDV affects 4.5–13% of chronic hepatitis B (CHB) patients globally, yet the prevalence of HDV infection in Canada is unknown. To investigate the prevalence, genotype, demographics, and clinical characteristics of HDV in Canada, we conducted a retrospective analysis of (1) HDV antibody and RNA positivity among referred specimens, and (2) a cross-sectional subset study of 135 HDV seropositive +/-RNA (HDV+) patients compared with 5,132 HBV mono-infected patients in the Canadian HBV Network.

Methods: Anti-HDV IgG-positive specimens collected between 2012 and 2019 were RNA tested and the genotype determined. Patients enrolled in the Canadian HBV Network were >18 years of age and HBsAg-positive. Clinical data collected included risk factors, demographics, comorbidities, treatment, fibrosis assessment, and hepatic complications.

Results: Of the referred patients, 338/7,080 (4.8%, 95% CI 4.3–5.3) were HDV seropositive, with 219/338 RNA-positive (64.8%, 95% CI 59.6–69.7). The HDV+ cohort were more likely to be born in Canada, to be White or Black/African/Caribbean than Asian, and reporting high-risk behaviours, compared with HBV mono-infected patients. Cirrhosis, complications of end-stage liver disease, and liver transplantation were significantly more frequent in the HDV+ cohort. HDV viraemia was significantly associated with elevated liver transaminases and cirrhosis. Five HDV genotypes were observed among referred patients but no association between genotype and clinical outcome was detected within the HDV+ cohort.

Conclusions: Nearly 5% of the Canadian HBV referral population is HDV seropositive. HDV infection is highly associated with

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Epidemiology and Risk Factors of Hepatitis Delta Infection in Turkey

Celal Ayaz[1], Suda Tekin Koruk[2], Aysun Yalci[3], Tansu Yamazhan[4], Bilgehan Aygen[5], Selma Tosun[6], Tuba Dal[7], Mustafa Kemal Celen[1] and Fehmi Tabak[8]

- Ülke genelinde 7366 HBsAg pozitif tarandı
- 206 adet HDV pozitif hasta saptandı
- Anti-HDV pozitifliği %2.8
- GDA Bölgesinde bu oran %4.5

- Hastaların %63,6'sı erkek
- Yaş ortalaması 34,4±15,9
- HBeAg pozitifliği %20.1

Risk faktörleri…

- Erkek olmak
- 5 yıldan uzun süreli HBsAg taşıyıcılığı
- Ailede en az bir HBsAg pozitiflği
- Güneydoğu Anadolu Bölgesinde yaşamak

JOURNAL OF PURE AND APPLIED MICROBIOLOGY, December 2013. Vol. 7(4), p. 2809-2813

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HDV için risk faktörleri...

Risk Factors for Delta Hepatitis in a North American Cohort: Who Should Be Screened?

Ben L. Da, MD[1], Farial Rahman, MS[1], Walter C. Lai, MD, PhD[1], David E. Kleiner, MD, PhD[2], Theo Heller, MD[1] and Christopher Koh, MD, MHSc[1]

INTRODUCTION: **The American As screening in certa**

METHODS: **A study of North A risk factors assoc histologic HDV ar**

RESULTS: **Six hundred fifty- HDV included: in and HDV endemi**

DISUSSION: **North American p**

SUPPLEMENTARY MATERIAL accompanies this p
lww.com/AJG/B734

Am J Gastroenterol 2021;116:206–209. https://do

Table 3. Univariate and multivariate analysis of the risk factors associated with HDV infection among HBsAg-positive patients who were checked for HDV Ab (n = 588)

Factor	Crude OR	95% CI	*P*	Adjusted OR[a]	95% CI	*P*
Age ≥ 40 (yr)	0.9	0.6–1.4	0.78	0.6	0.4–1.2	0.14
Gender—male	1.2	0.8–1.9	0.32	0.6	0.3–1.1	0.08
HIV	0.3	0.04–2.6	0.3	0.6	0.04–9.3	0.74
HCV	0.7	0.09–6.0	0.76	0.2	0.01–4.3	0.33
HBeAg positivity	0.4	0.2–0.8	0.013	0.5	0.1–1.8	0.29
HBeAb positivity	1.5	0.9–2.4	0.14	0.6	0.2–1.6	0.26
HBV-DNA below 2,000 IU/mL	6.1	3.3–11.2	<0.0001	7.8	3.6–17.1	<0.0001
ALT > 40 U/L	4.3	2.7–6.9	<0.0001	7.4	3.9–14.1	<0.0001
IVDU	14.0	4.4–44.2	<0.0001	25.2	4.0–161.4	0.0007
HDV endemic country of origin	4.8	3.1–7.4	<0.0001	5.8	3.1–10.8	<0.0001
Antinucleo(s)tide therapy	2.1	1.1–4.1	0.03	2.6	0.8–8.4	0.12

Values expressed as mean (SD) or n (%); Patients in whom HDAb was not checked were excluded.
ALT, alanine aminotransferase; CI, confidence interval; HCV, hepatitis C virus; HBeAg, hepatitis B e-antigen; HBeAb, hepatitis B e-antibody; HBV, hepatitis B virus; HDV, hepatitis D virus; HBsAg, hepatitis B surface antigen; HDAb, hepatitis D virus antibody; IVDU, intravenous drug user; OR, odds ratio.
[a]Adjusted for ALT > 40 IU/L.

Hepatit Delta nedir?

- Bilinen hepatit virüsleri içerisinde prognozu en ağır olanıdır
- Defektif bir virüstür
- Co-infeksiyon veya süperenfeksiyon
- Vakaların %70-90 şiddetli seyretmektedir
- A.B.D.'lerinde en az 125.000 vaka
- Dünya genelinde 12-60 milyon vaka

Bulaşma Yolları

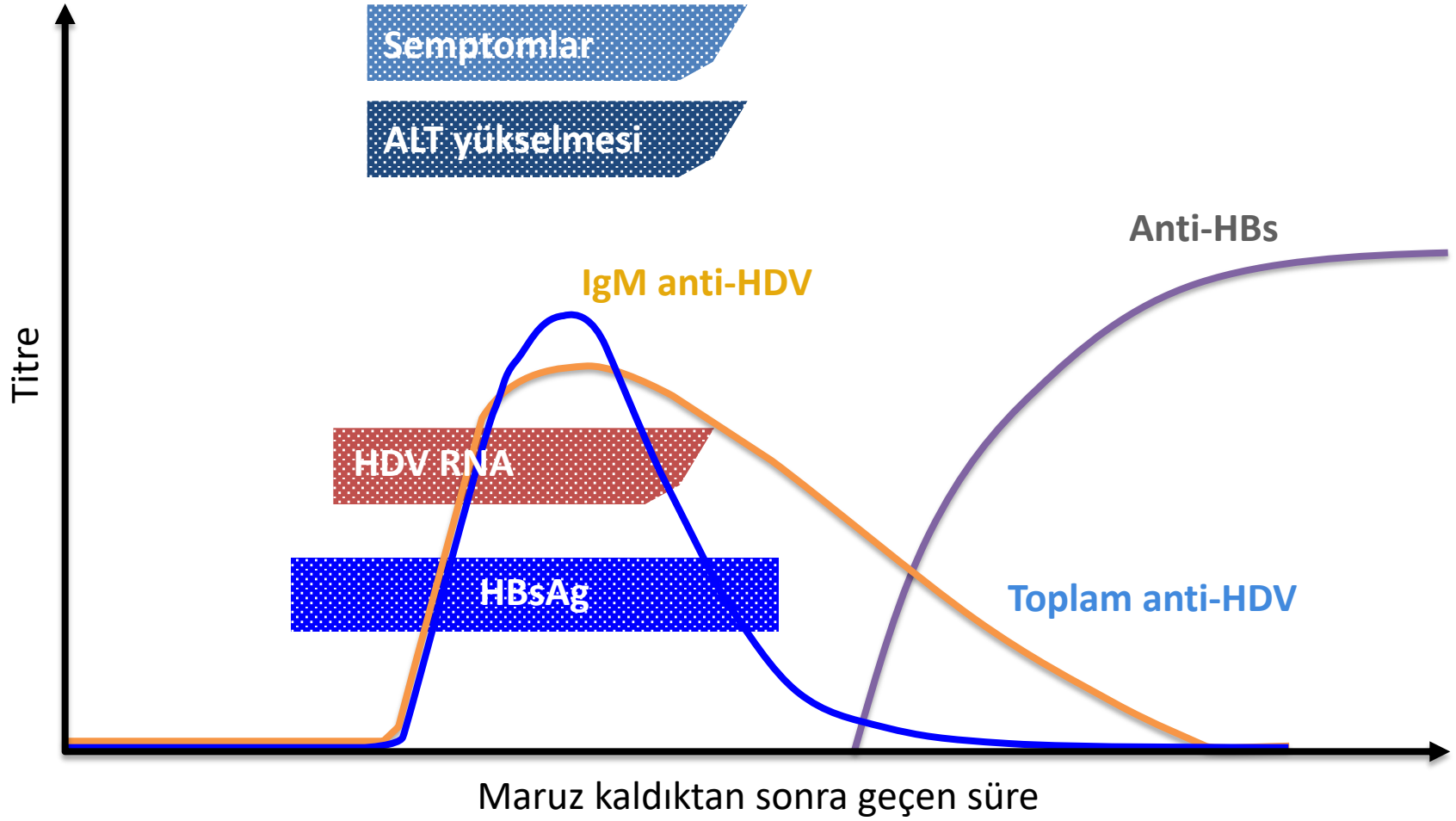
- Kan ve diğer vücut sıvılarının teması ile
- Vertikal bulaşı nadir
- HBV ile bulaşı olan herkes risk altındadır
- Uyuşturucu kullananlar, sex işçileri, MSM, HCV ile yaşayanlar ve HIV/HBV'nin yoğun olduğu bölgelerde yaşayanlar risk altındadır

Koenfeksiyon

- HBV ve HDV ile eşzamanlı enfekekte olması sonucu gelişir
- HDV enfeksiyonu, HBV hepatositleri enfekte ettikten sonra başlar
- Akut enfeksiyon tek bir pik veya bifazik pik gösterebilir.
- Koenfeksiyon akut hepatitten ayrılması zor ve %95 oranında hasta kendiliğinden düzelir

HBV-HDV eş zamanlı enfeksiyonu

Tipik serolojik süreç



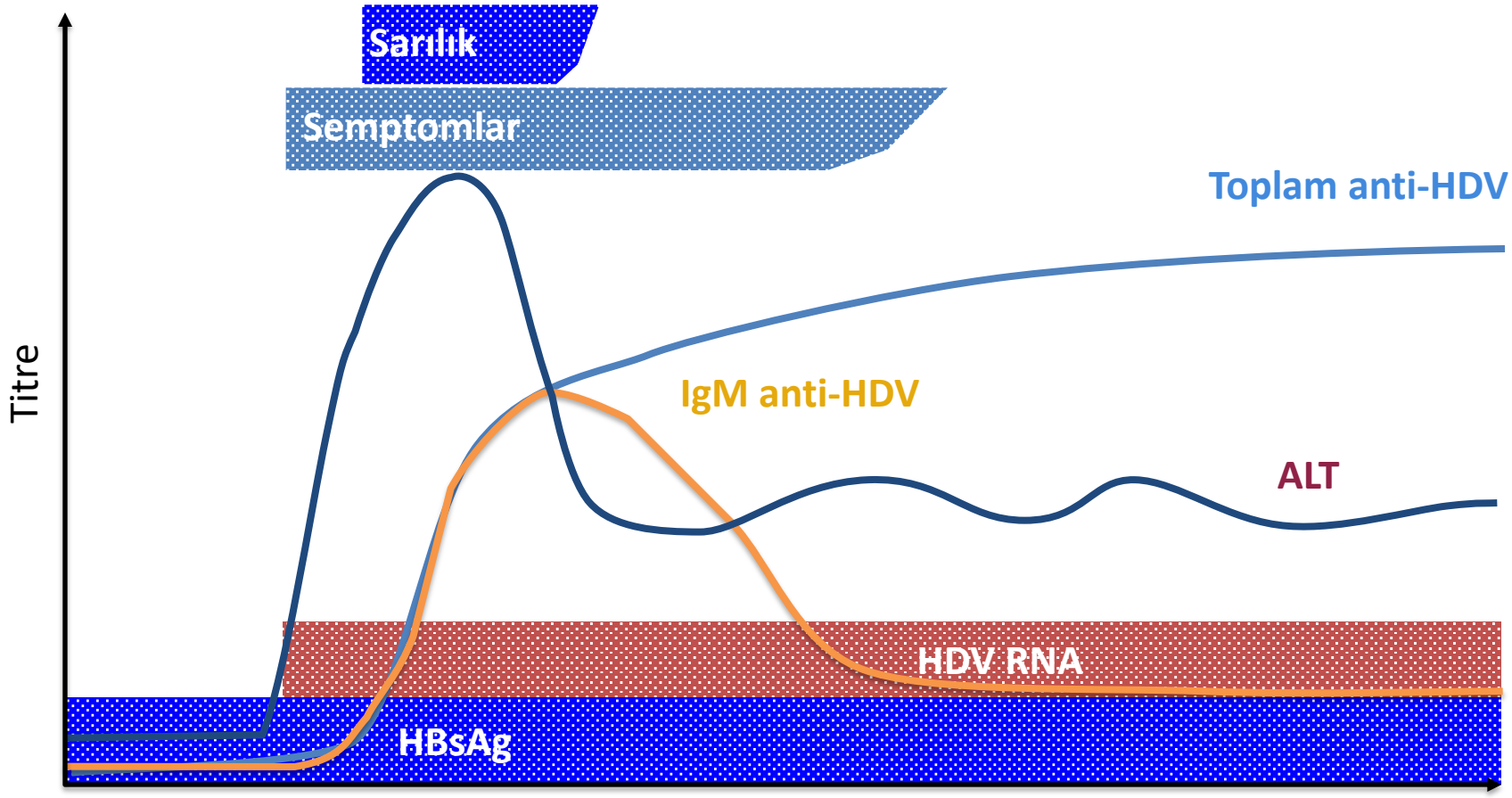
Uyarlanmıştır: Rizzetto M, & Verme G, *J Hepatol;*1985;**1**:187-193.

Süperenfeksiyon

- Kronik HBV zemininde gelişen enfeksiyondur
- Delta süperenfeksiyonu %90 oranında kronikleşir
- Spontan klirens oldukça düşüktür
- Anti HBc IgM negatifliği anlamlıdır

HBV-HDV süper enfeksiyonu

Tipik serolojik süreç



Uyarlanmıştır: Rizzetto M, & Verme G, *J Hepatol*.1985:**1**:187-193.

Clinical Trial > Lancet Infect Dis. 2019 Mar;19(3):275-286. doi: 10.1016/S1473-3099(18)30663-7.

Peginterferon alfa-2a plus tenofovir disoproxil fumarate for hepatitis D (HIDIT-II): a randomised, placebo controlled, phase 2 trial

Heiner Wedemeyer [1], Cihan Yurdaydin [2], Svenja Hardtke [3], Florin Alexandru Caruntu [4], Manuela G Curescu [5], Kendal Yalcin [6], Ulus S Akarca [7], Selim Gürel [8], Stefan Zeuzem [9], Andreas Erhardt [10], Stefan Lüth [11], George V Papatheodoridis [12], Onur Keskin [13], Kerstin Port [14], Monica Radu [4], Mustafa K Celen [6], Ramazan Idilman [13], Kristina Weber [15], Judith Stift [16], Ulrike Wittkop [17], Benjamin Heidrich [3], Ingmar Mederacke [14], Heiko von der Leyen [18], Hans Peter Dienes [16], Markus Cornberg [14], Armin Koch [15], Michael P Manns [19], HIDIT-II study team

Affiliations + expand

PMID: 30833068 DOI: 10.1016/S1473-3099(18)30663-7

14 merkezli bir çalışma

Randomize plasebo kontrollü

59 hastaya PEG-INF+TDF

61 hastaya PEG-INF+plasebo

944 AO izlendi

SVR açısından fark yok ☹

Delta İnfeksiyonunda Son Durum !

- 30 yılı aşkın bir süredir içimizde
- Karaciğer sirozu ve HCC ile doğrudan ilişkilidir
- Oral antiviral tedaviler etkisizdir
- Pegile interferon alfa kullanımı viral yükü %25 oranında negatifleştirmektedir
- Geleceğin tedavisi

"Prenylation İnhibitörleri"

Wedemeyer H. Hepatitis D Revival. Liver Int 2011

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DOI: 10.1111/apt.16408

APT Alimentary Pharmacology & Therapeutics WILEY

Durable virological response and functional cure of chronic hepatitis D after long-term peginterferon therapy

Julian Hercun[1] | Grace E. Kim[1] | Ben L. Da[1] | Yaron Rotman[1] | David E. Kleiner[2] | Richard Chang[3] | Jeffrey S. Glenn[4] | Jay H. Hoofnagle[5] | Christopher Koh[1] | Theo Heller[1]

- Toplamda 12 vaka
- %83 beyaz ırk
- %92'si erkek
- Tedavi: 74 ay Peg-INF
- Takip süresi 104 ay
- SVR oranı %58
- HBsAg kaybı %33

Summary

Background: Hepatitis delta virus (HDV) infection is the most aggressive form of chronic viral hepatitis. Response rates to therapy with 1- to 2-year courses of pegylated interferon alpha (peginterferon) treatment are suboptimal.

Aims: To evaluate the long-term outcomes of patients with chronic hepatitis D after an extended course of peginterferon.

Methods: Patients were followed after completion of trial NCT00023322 and classified based on virological response defined as loss of detectable serum HDV RNA at last follow-up. During extended follow-up, survival and liver-related events were recorded.

Results: All 12 patients who received more than 6 months of peginterferon in the original study were included in this analysis. The cohort was mostly white (83%) and male (92%) and ranged in age from 18 to 58 years (mean = 42.6). Most patients had advanced but compensated liver disease at baseline, a median HBV DNA level of 536 IU per mL and median HDV RNA level of 6.86 $\log_{10}$ genome equivalents per mL. The treatment duration averaged 6.1 years (range 0.8-14.3) with a total follow-up of 8.8 years (range 1.7-17.6). At last follow-up, seven (58%) patients had durable undetectable HDV RNA in serum, and four (33%) cleared HBsAg. Overall, one of seven (14%) responders died or had a liver-related event vs four of five (80%) non-responders.

Conclusions: With further follow-up, an extended course of peginterferon therapy was found to result in sustained clearance of HDV RNA and favourable clinical outcomes in more than half of patients and loss of HBsAg in a third.

HDV ve KÜR !?!?

- Hepatit D, karaciğer ilişkili mortalitesi en yüksek olan viral hepatit tipidir.

Prenylation inhibitörleri

Giriş yolu inhibitörleri

Nükleik asid polimeraz blokerleri

- Ciddi yan etkiler ve uzun dönem takiplerde relaps oranı yüksektir
- Acil olarak yeni tedavi seçeneklerine ihtiyaç var.

Wranke A, Wedemeyer H. Antiviral therapy of hepatitis delta virus infection - progress and challenges towards cure. Curr Opin Virol. **2016 Oct 25;20:112-118**.

HDV kontrol altına alınabilir mi?

- Faz II çalışmaları umut verici

Kısa süreli 200 mg/gün oral farnesyl transferaz inhibitörü ile tüm hastalarda viral yük düzeyinde 10 kat düşüş izlenmiş. Ancak hastaların çoğunda dispepsi ve kilo kaybı izlenmiş

stoyl

etkin

nmiş

- de ve

Heparan sulphate glycosaminoglycans viral absorbsyon için son derece önemlidir.

Abeywickrama-Samarakoon N, Cortay JC, Dény P. The hepatitis D satellite virus of hepatitis B virus: half-opening a new era to control viral infection? Curr Opin Infect Dis. 2016 Dec;29(6):645-653.

Editorial

CrossMark

EASL JOURNAL OF HEPATOLOGY

Journal of Hepatology **2016** vol. 65 | 465–466

Myrcludex B, a novel therapy for chronic hepatitis D?

Mario Rizzetto[1,*], Grazia Anna Niro[2]

[1]*Department of Internal Medicine – Gastroenterology, University of Torino, Italy;* [2]*IRCCS "Casa Sollievo Sofferenza" Hospital, Gastroenterology Unit, San Giovanni Rotondo (FG), Italy*

See Articles, pages 483–489 and pages 490–498

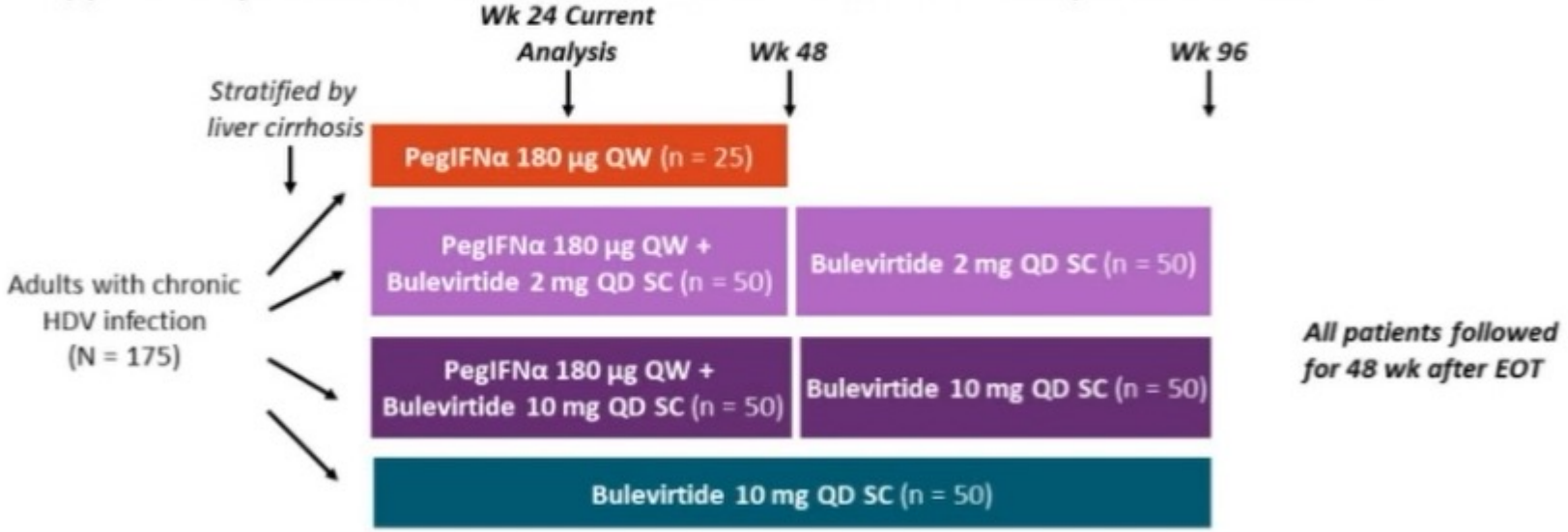
The second paper (Treatment of chronic hepatitis D with the entry inhibitor myrcludex B – first results of a Phase Ib/IIa study; Pavel Bogomolov *et al.*) reported the interim results of the use of Myrc in CHD, and aimed to provide a proof of concept of the blocking strategy. The rationale was that the prolonged inhibition of the HDV entry by the HBsAg block should protect uninfected hepatocytes from new HDV infection, ultimately leading to the eradication of the virus.

Myrcludex B 2 mg/gün s.c. 24 hafta

MYR204: FAZ IIB

MYR204: Bulevirtide Alone and Combined With PegIFNα-2a for Chronic HDV Infection: Wk 24 Analysis

- Multicenter, international, open-label, randomized phase IIB trial of bulevirtide, entry inhibitor approved by EMA for use in adults with chronic HDV and compensated cirrhosis

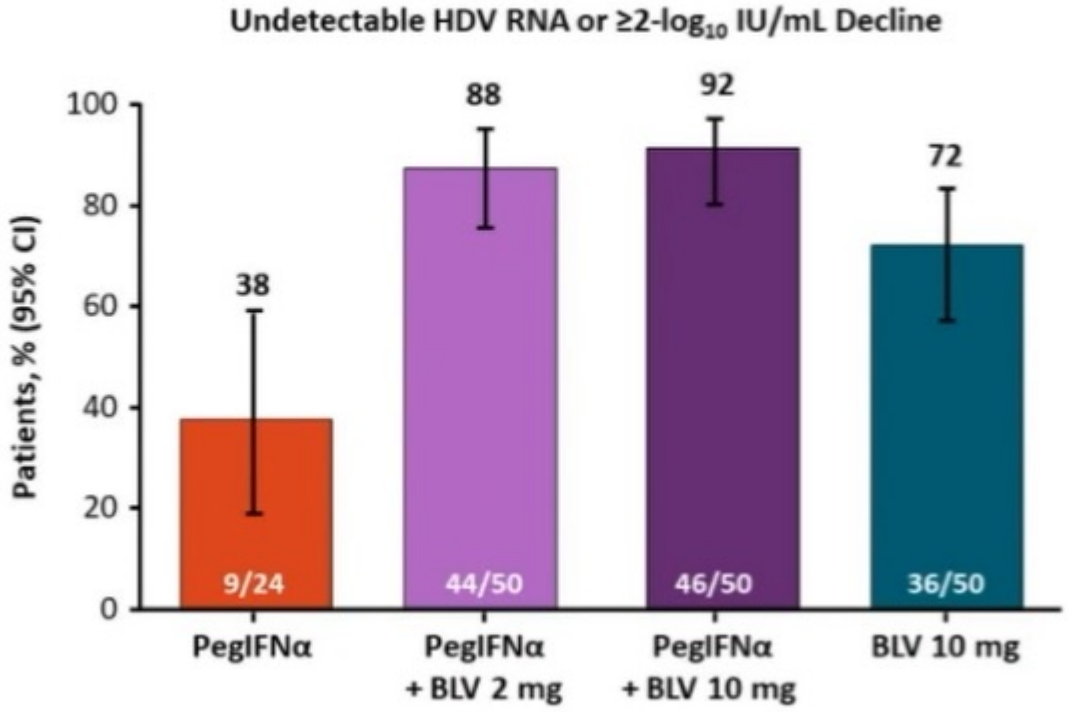


- Primary endpoint: Undetectable HDV RNA (LLD: 6 IU/mL) at Wk 24 after EOT

Asselah. EASL 2020. Abstr 2717.

Slide credit: clinicaloptions.com

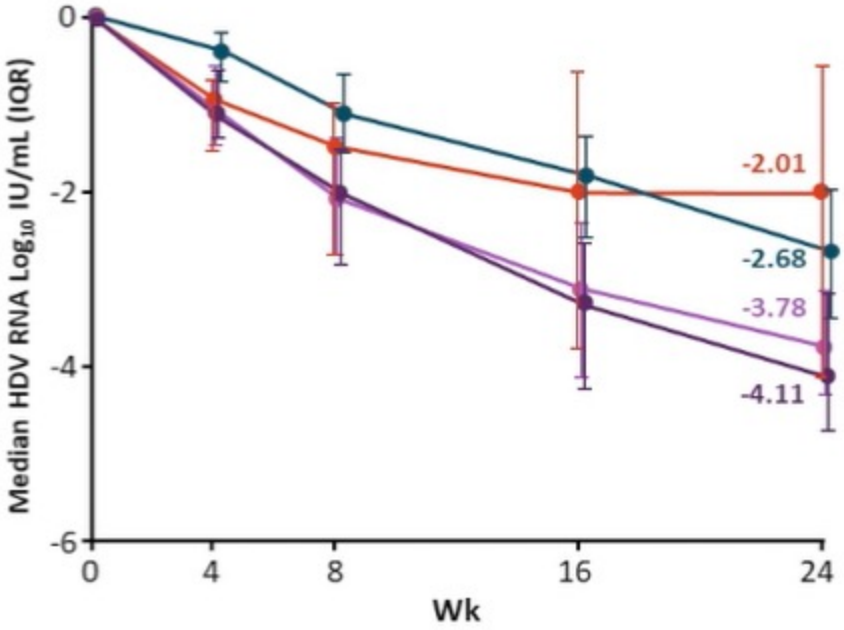
MYR204 Interim Wk 24 Analysis: Virologic Response

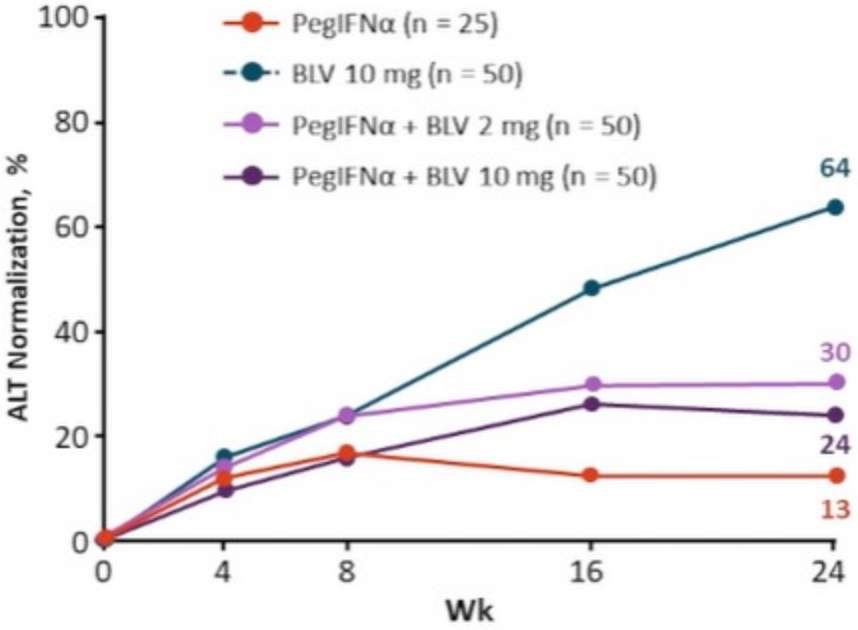


Asselah. EASL 2020. Abstr 2717.

Slide credit: clinicaloptions.com

MYR204 Interim 24-Wk Analysis: HDV RNA





- No serious AEs related to bulevirtide use or AEs leading to d/c in bulevirtide-treated patients
- ISRs observed in patients receiving bulevirtide mostly mild; frequency 8% to 16% across arms

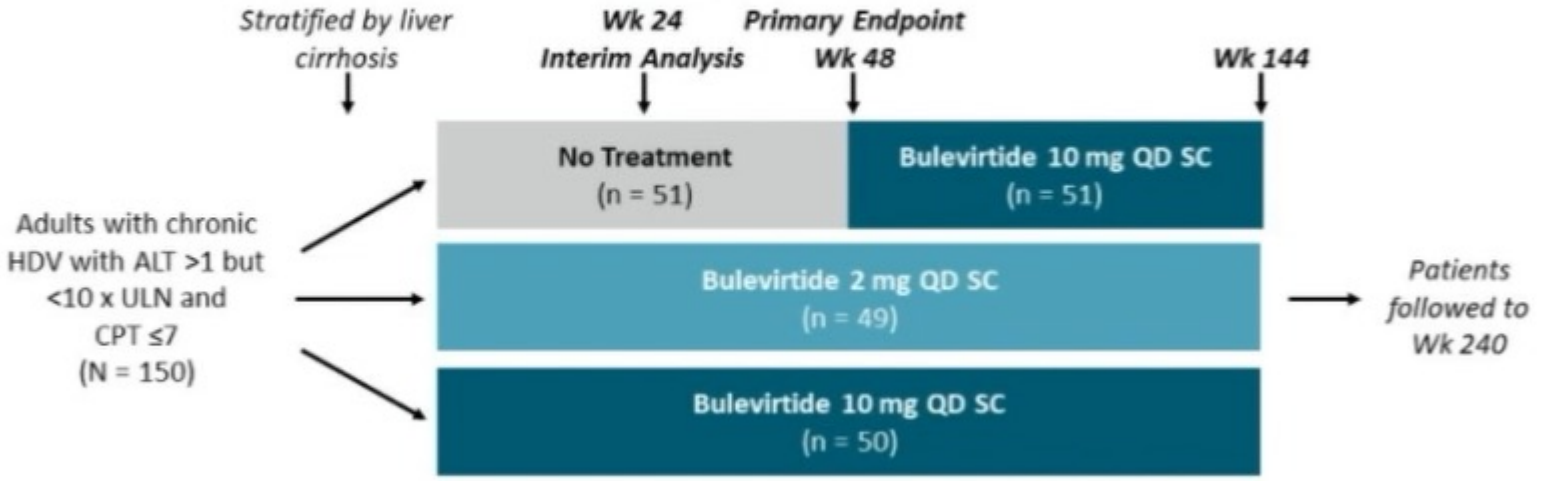
Asselah. EASL 2020. Abstr 2717.

Slide credit: clinicaloptions.com

MYR301: FAZ III

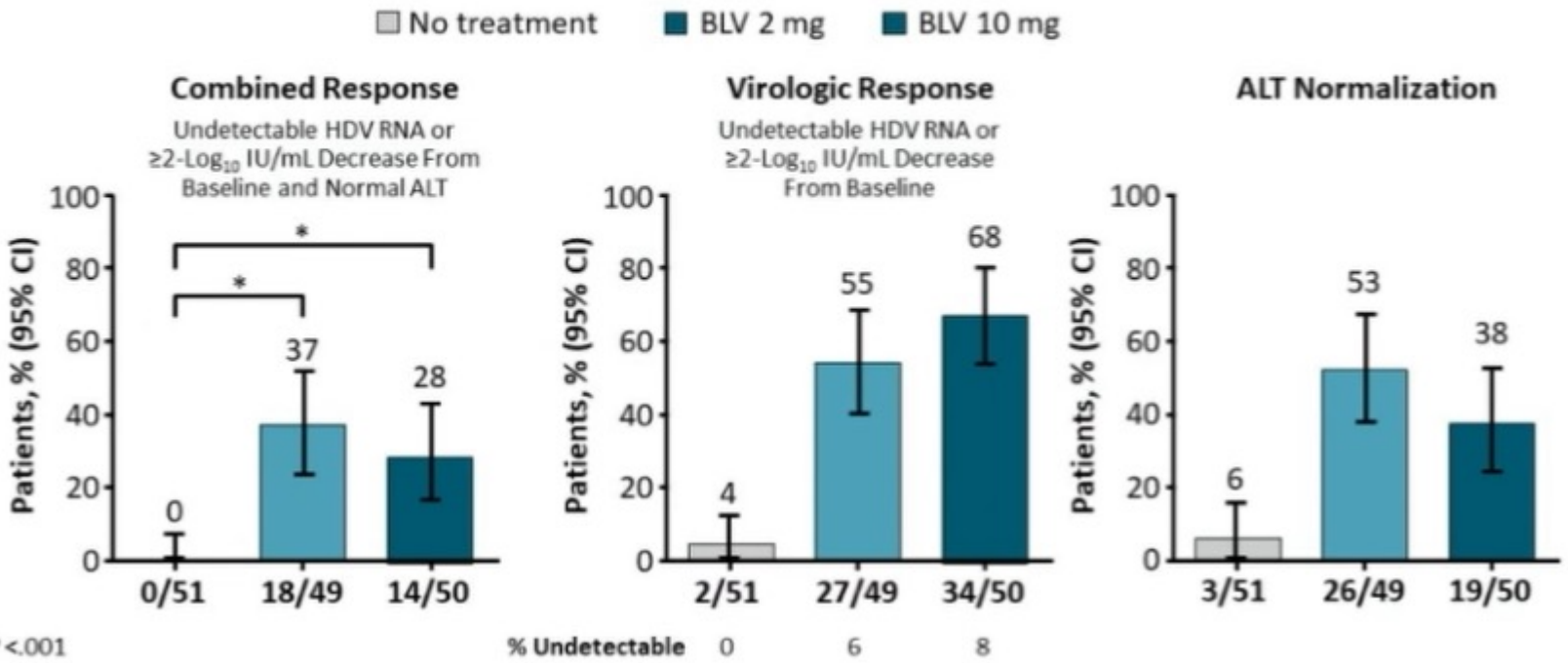
MYR301: High- vs Low-Dose Bulevirtide Monotherapy in Patients With Chronic HDV Infection

- Multicenter, open-label, randomized, phase III trial



- Primary endpoint: Combined response defined by undetectable HDV RNA or decrease by ≥2 $\log_{10}$ IU/mL from baseline + normalized ALT at Wk 48

MYR301 Interim Analysis: Virologic Efficacy at Wk 24



EIGER BIOPHARMACEUTICALS

Working to change the face of Hepatitis Delta Virus

D-LIVR

Study Newsletter

27 OCTOBER 2021

- Lonafarnib + PEG-INF
- PEG-INF
- Lonafarnib
- 18 hasta dahil edildi
- SVR %30
- AE çok fazla

EIGER BIOPHARMACEUTICALS

LMT-2 NEWSLETTER

biorasi Faster Trials

EIG-LMD-002 | July 2022 | ISSUE #1

SCREENING & ENROLLMENT UPDATES

There are **109 patients screened** in the study and **18 sites activated** in Romania, Moldova, Turkey, Spain, USA, Israel and Germany.

Let us continue working together as we are looking to screen up to 200 more patients.

Congratulations to **Dr. Grambihler** on your site's recent activation! We wish you and your study participants the best of luck!

Site	Country	No. of Patients
Dr. Elena Laura Iliescu	Romania	23
Dr. George Sebastian Gherlan	Romania	20
Dr. Adela Turcanu	Moldova	16
Dr. Mustafa Kemal Celen	Turkey	16
Dr. Alexandru Florin Caruntu	Romania	13
Dr. Liliana Baroiu	Romania	7
Dr. Maria Buti	Spain	7
Dr. Ho Bae	United States	4
Dr. Yana Davidov	Israel	2
Dr. Dieterich	United States	1

Olgu-I

- 43 yaş, erkek, evli, Subay (2019)
- İzmir'de yaşıyor görev icabı burada
- Aslen Van'lı
- 8 yıl önce tanı almış
- HBV+HDV
- HBVDNA 112 IU/ml
- HDVRNA 43.000
- ALT 65

- Non sirotik
- USG de dalak normal
- Anti-HCV negatif
- Steatoz yok
- AST 40
- Trombosit 239.000
- Tedavi almaya istekli

Ne önerirsiniz?

- Takip???
- Karaciğer Biyopsisi ??
- Yeni tedavileri bekleyelim !!!

Biyopsi yapıldı…

- Fibrozis 3
- HAI 7

- Pegasys başlandı 180 mcg/haftalık

- Tx 8. haftası ALT 289, Trombositler 145.000

- Ne yapmalı??? Ve ne olmuş olabilir??

Tedaviye devam edildi…

- 12. haftada HDV-RNA 2.300 IU/ML
- 16. haftada ALT 33
- 24. haftada HDV-RNA negatif
- 48. haftada HDV-RNA negatif

Advers Olaylar

- Hasta toplamda 9 kg verdi
- 7. ayda antidepresan başlandı
- PEG-INF uyumu %98
- Bulantı, kusma, halsizlik, kas ağrısı, baş ağrısı
- Uykusuzluk

Tedavi Sonu Takipleri

- 6. ay HDVRNA negatif, ALT N
- 12.ay HDVRNA negatif, ALT N
- 24.ay HDVRNA negatif, ALT N

Olgu II

- 41 yaşında erkek hasta
- 15 yıldır HDV+HBV
- 2010 ve 2015 da iki kez Peg INF tedavisi almış
- Nüks
- Non sirotik hasta
- HBV DNA negatif
- HDV RNA 109.000 kp/ml, ALT 71

Faz III çalışamasına dahil oldu

- Lonafarnib+PEG
- Tedavinin 12 haftasında kilo kaybı %4
- Bulantı, kusma ve İshal mevcut
- HDV RNA 1.240 kopya/ml

- Tedavinin 48 haftasında HDV RNA negatif

- ALT normal

Zor bir tedavi, çok sayıda AO mevcut

TS 6. ay hasta iyi ve HDV RNA negatif ☺

2021 Aralık ☺

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JVH WILEY

INVITED REVIEW

Chronic hepatitis D—What is changing?

David Yardeni | Theo Heller | Christopher Koh

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Abstract

Hepatitis D virus (HDV) infection is a chronic viral disease of the liver that is still largely considered to be incurable due to lack of effective treatment options. Without treatment, the risk for the development of advanced liver disease, cirrhosis and hepatocellular carcinoma is significantly high. Currently, new therapeutic options are emerging out of ongoing phase 3 clinical trials, promising a new hope of cure for this devastating liver infection. Recently, bulevirtide, a first in its class HDV entry inhibitor, has received conditional authorization of use from the European Medicines Agency (EMA) and was also submitted for approval in the United States. Other novel therapeutic options in clincal trials include interferon lambda, the prenylation inhibitor lonafarnib and nucleic acidic polymers (NAPs). This review describes all recent advances and ongoing changes to the field of HDV therpaeutics.

KEYWORDS
chronic liver disease, hepatitis D, treatment

Key Questions on Emerging Treatments for Hepatitis Delta

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Bulevirtid kullanımını optimize etmek için cevaplanması gereken sorular var

Monoterapi olası mı?

- Bulevirtidi monoterapi olarak kullanırsak idame tedavisi gerekir mi?
- Bulevirtid ile tedavi edilen bazı hastalarda tedaviyi durdurabilir, Faz II çalışmalarda bu durum görüldü
- Ancak bunun daha büyük bir hasta popülasyonu için geçerli olup olmadığı MYR301 çalışması tarafından yanıtlanacaktır.

Kombinasyon tedavis ve tedavi süresi?

- İnterferon ile kombinasyon tedavisi bir seçenek midir?
- Kombinasyon tedavisinde sinerjik etkiler görüldü, veriler henüz yetersiz
- Bir hasta her iki ilacı da bıraktığında ne olduğunu henüz biliminmemekte
- Devam eden MYR204 çalışma sonuçları beklenmektedir

Yanıtsız hastalar !!!

- Bulevirtid tedavisine yanıt vermeyebilecek hastalar var mı?
- Hangi faktörler tedavi yanıtını etkiler?
- Tedaviyi bıraktıktan sonra nüks?
- Bu vakalardan herhangi biri doğruysa, bulevirtide ek alternatif tedavilere ihtiyacımız olabilir mi?

Sonuç Olarak…

Review

HBV/HDV Co-Infection: Epidemiological and Clinical Changes, Recent Knowledge and Future Challenges

Caterina Sagnelli, Evangelista Sagnelli *, Antonio Russo, Mariantonietta Pisaturo, Laura Occhiello and Nicola Coppola

En habis hepatotrop virüs olduğu kesin

Dekompanse Siroz artışı HBV'ye göre 7 kat fazla

HCC gelişimi HBV'ye göre 3 kat fazla

Orta Afrika'dan, Avrupa'ya Genotip 5-8 olan HDV enfeksiyonlarında artış

Pegile-İnterferon da SVR (%20-30)

HBV'de kullanılan OAV tedaviler HDV'de etkin değil

Lonafarnib, Bulevirtide ve Nucleic Acid Polymers daha etkin ancak AO az değil

Kombinasyon Tedavileri