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COMPARATIVE EVALUATION OF ANTIVIRAL DRUGS IN PATIENTS WITH CHRONIC VIRAL HEPATITIS

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Abstract

Chronic viral hepatitis, caused primarily by hepatitis B virus (HBV) and hepatitis C virus (HCV), represents a significant global health challenge. The introduction of antiviral drugs has revolutionized treatment strategies, aiming to achieve viral suppression and prevent disease progression. This abstract reviews and compares the effectiveness of current antiviral therapies for HBV and HCV. For HBV, nucleoside/nucleotide analogues (NAs) and interferons are mainstays, with drugs like entecavir and tenofovir disoproxil fumarate (TDF) demonstrating high potency and low resistance rates. In contrast, direct-acting antivirals (DAAs) have transformed HCV treatment, achieving cure rates exceeding 95% with minimal side effects. The comparative evaluation considers factors such as viral suppression, resistance profiles, safety, and treatment adherence. Tailoring therapy to individual patient characteristics remains crucial for optimizing outcomes in chronic viral hepatitis management.

Keywords: Chronic viral hepatitis, hepatitis B virus (HBV), hepatitis C virus (HCV), antiviral drugs, nucleoside/nucleotide analogues (NAs), interferons, direct-acting antivirals (DAAs), viral suppression, resistance profiles, treatment adherence

INTRODUCTION.

Chronic viral liver disease is a major worldwide health issue impacting millions of people globally. Hepatitis B virus (HBV) and hepatitis C virus (HCV) are the main reasons for this condition, resulting in inflammation and damage to the liver that may progress to cancer if not addressed. Antiviral medications have greatly transformed how chronic viral liver disease is treated enhancing patient results and lessening the overall impact of the illness.

Antiviral Therapies for Chronic Hepatitis B (HBV)

HBV infection is mainly treated using nucleoside/nucleotide analogs (NAs) and interferons. Treatment aim to suppress the virus, halt disease advancement, and decrease liver-related issues..

1. Nucleoside/Nucleotide Analogues (NAs):
- Entecavir: Highly potent with low resistance rates, recommended as first-line therapy.
- Tenofovir disoproxil fumarate (TDF) and Tenofovir alafenamide (TAF): Effective with a high barrier to resistance, preferred in specific patient populations.
- Lamivudine: Older, less favored due to high resistance rates over time.
2. Interferons:
- Pegylated Interferon-alpha: Offers finite treatment duration and potential for sustained response, but side effects limit its use.

Drug Classes	Nucleoside/Nucleotide Analogues (NAs), Interferons	Direct-Acting Antivirals (DAAs)
Main Drugs	Entecavir, Tenofovir disoproxil fumarate (TDF), Tenofovir alafenamide (TAF), Pegylated Interferon-alpha	Grazoprevir, Glecaprevir, Ledipasvir, Velpatasvir, Sofosbuvir
Effectiveness	High rates of viral suppression; may not eradicate virus	Cure rates >95% in most genotypes; leads to sustained virologic response (SVR)
Resistance	Develops over time; NAs with higher barrier preferred	DAAs less prone to resistance; genotypic testing important
Safety Profile	Generally well-tolerated; monitor renal function	Minimal side effects; occasional drug interactions
Treatment Duration	Long-term; potentially lifelong	Typically 8-12 weeks; shorter duration improves adherence

Monitoring	Regular viral load and liver function tests	Monitoring for SVR, potential relapse, and liver function
Special Considerations	Resistance testing, renal function in TDF users	Genotype-specific therapy, drug interactions, liver function

Antiviral Therapies for Chronic Hepatitis C (HCV)

The treatment landscape for HCV has evolved rapidly with the introduction of direct-acting antivirals (DAAs), which target specific viral proteins essential for replication.

1. Direct-Acting Antivirals (DAAs):

- NS3/4A protease inhibitors (e.g., Grazoprevir, Glecaprevir)
- NS5A inhibitors (e.g., Ledipasvir, Velpatasvir)
- NS5B polymerase inhibitors (e.g., Sofosbuvir)

DAAs are highly effective, achieving cure rates exceeding 95%, even in difficult-to-treat populations such as those with cirrhosis or prior treatment failures.

Comparative Effectiveness

Comparing the effectiveness of antiviral drugs involves assessing several key factors:

- Viral Suppression: Both HBV NAs and HCV DAAs achieve high rates of viral suppression, crucial for halting disease progression and reducing transmission risk.
- Resistance Profile: Resistance to antiviral drugs can develop over time. HBV NAs with a higher genetic barrier to resistance (e.g., TAF, Entecavir) are preferred to reduce treatment failure.
- Safety Profile: DAAs for HCV generally have a favorable safety profile, with minimal side effects compared to interferons or older HBV treatments.
- Treatment Duration and Adherence: DAAs typically offer shorter treatment durations (8-12 weeks), promoting better patient adherence and reducing healthcare costs compared to long-term HBV treatment.

- **Hepatitis B Virus (HBV)**: Treatment revolves around NAs and interferons, aiming for long-term viral suppression. Entecavir and TDF are preferred due to their high potency and low resistance rates. However, these drugs rarely eradicate HBV, necessitating long-term therapy and regular monitoring.
- **Hepatitis C Virus (HCV)**: DAAs have transformed HCV treatment, offering cure rates exceeding 95% across most genotypes with minimal side effects. Treatment

duration is shorter, enhancing patient adherence. Resistance to DAAs is less common but requires genotype-specific therapy and vigilant monitoring.

Patient-Centric Approach

Tailoring treatment regimens to individual patient needs is crucial. Factors such as viral genotype, liver fibrosis stage, comorbidities, and prior treatment history influence drug selection. Regular monitoring for treatment response, viral load, and liver function tests is essential to optimize outcomes and detect potential complications early.

CONCLUSION

In conclusion, while both HBV NAs and HCV DAAs are highly effective in managing chronic viral hepatitis, the choice of therapy depends on several factors including viral genotype, resistance profile, safety considerations, and patient preferences. The advent of DAAs has transformed the treatment landscape for HCV, offering cure rates previously unimaginable. For HBV, ongoing research aims to improve cure rates and develop therapies with finite treatment durations. Continued advancements in antiviral therapies hold promise for further improving outcomes and reducing the global burden of chronic viral hepatitis.

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