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A Comprehensive Overview of Chronic Hepatitis D Virus Infection and Treatment Approaches

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Introduction

Chronic Hepatitis D Virus infection is a complex and often severe liver disease that remains a significant global health challenge. The hepatitis D virus is unique among hepatitis viruses due to its reliance on another virus, Hepatitis B Virus (HBV), for replication. HDV infection occurs exclusively in individuals who are already infected with HBV, creating a dual infection scenario that can lead to more serious outcomes than either infection alone. Despite the limited understanding of HDV and its clinical management, advancements in diagnostics and treatment have made it possible to control this challenging viral disease. Hepatitis D Virus, also known as the delta virus, is a small, defective RNA virus that requires HBV for its life cycle. Unlike other hepatitis viruses, HDV is incomplete by itself, lacking the ability to replicate without the helper function provided by the hepatitis B surface antigen. HDV particles consist of a circular RNA genome surrounded by a protein coat, and they can only infect cells that are already infected with HBV, making HDV infection dependent on the presence of HBV. HDV is transmitted in a similar manner to HBV, primarily through blood and other bodily fluids, making it a major risk for individuals with high-risk behaviors, such as those who inject drugs or engage in unprotected sex with an infected individual. Moreover, co-infection with HBV and HDV or superinfection of an individual already chronically infected with HBV can significantly exacerbate the progression of liver disease [1,2].

Description

Once HDV enters a hepatocyte (liver cell), it utilizes the HBV surface antigen to enter the cell. Inside the cell, the HDV RNA genome is replicated, and the virus produces new virions that exit the hepatocyte to infect surrounding cells. The presence of HDV in the liver triggers an immune response, leading to liver inflammation and tissue damage. Chronic HDV infection often results in more severe liver pathology compared to HBV monoinfection. This is due to the increased immune response that is activated by HDV replication, which causes greater hepatocellular damage. Infected individuals may experience rapid progression to cirrhosis and liver failure. Furthermore, those with chronic HDV infection are at a significantly increased risk for developing liver cancer (hepatocellular carcinoma, HCC), with studies showing that HDV infection increases the risk of HCC by a factor of 10 to 15 compared to HBV infection alone [3-5].

Conclusion

Chronic HDV infection is a severe liver disease that presents a unique challenge to both clinicians and patients. The disease is often more aggressive than HBV infection alone, leading to higher rates of cirrhosis and liver cancer. Although treatment options have been limited in the past, recent advancements, particularly the development of bulevirtide, have shown promise in reducing the burden of this disease. However, much work remains to be done in terms of expanding access to treatment and improving long-term outcomes for individuals affected by chronic HDV infection. As research continues, it is hoped that new therapeutic strategies will emerge to provide a more effective and lasting solution for this serious global health issue. Several nucleos(t)ide analogs, such as tenofovir and entecavir, have been used to treat HBV infection. However, these drugs are not effective against HDV alone, as they do not inhibit the replication of the delta virus. Despite this, the use of these antivirals can suppress HBV replication, which may help reduce the levels of HDV in co-infected individuals.

Acknowledgement

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Conflict of Interest

None.

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