



## Hepatitis Delta Virus

It is estimated that 15 million of the people carrying hepatitis B virus (HBV) worldwide are infected by hepatitis D virus. HDV increases the risk of severe hepatitis and mortality when compared to HBV alone. Rate of hepatitis D infection mortality among chronic HBV patients is high, ranging between 2% and 20%.

Hepatitis D is caused by the hepatitis delta virus (HDV) a unique RNA pathogen that requires the presence of hepatitis B surface antigen for assembly and replication, therefore, infection cannot occur without prior HBV infection. As a sub-viral satellite HDV requires the envelope proteins of HBV to facilitate assembly of the genome and to allow attachment and entry into new host cells. Transmission is by parenteral exposure and can occur simultaneously with HBV (co-infection) or subsequent to HBV infection (superinfection). Co-infection is clinically indistinguishable from acute hepatitis B and is usually self-limiting; the rate of progression to chronicity is the same as that for HBV (<5%). Superinfection, however, usually induces a severe form of chronic hepatitis and can lead to accelerated fibrosis and hepatocellular carcinoma or even rapid fulminant liver failure.

HDV acute infection is usually self-limited; markers often disappear within a few weeks and can be undetectable in some instances. HDV RNA is an early and sensitive marker of HDV replication in acute HDV infection

HDV super-infection in chronic hepatitis B may lead to suppression of HBV markers during acute phase, presenting serological tests with positive results for HDV, but negative for HBV. HDV antigen is the only antigen encoded by the HDV genome, it is able to be detected in the early stages of infection but usually clears quickly. HDV antibodies, however, can persist for years. HDV RNA is also found in serum of super-infected patients. Chronic HDV infection will persistently suppress HBV replication.

# The Interpretation of Diagnostic Blood tests for Hepatitis D Virus

**Note: HDV is always associated with Hepatitis B infection**

**HDV Ab** - Hepatitis D antibody – anti-HDV.

- **DETECTED** in both acute cases and in those previously exposed.
- Duration of detection may vary depending on assay sensitivity and specificity and duration of continued exposure to the virus.

**HDV Ab IgM** - IgM anti-HDV

- Usually **DETECTABLE** at the onset of symptoms and/or abnormal liver function. This may be 2 to 9 weeks after exposure.
- May be **UNDETECTABLE** in acute cases and false positives can occur.
- Duration of **DETECTION** varies between patients and on assay used.
- Strongly positive results are rarely **DETECTED** 3 months after the onset of symptoms.

**HDV Ag**

- May be detected within a few days after infection.
- Test not widely available.

**HDV RNA** - Hepatitis D Virus RNA.

- Presence in blood indicates infectivity and active viral replication.
- May be **DETECTED** in blood immediately prior to the onset of symptoms.
- May become **UNDETECTABLE** within a few days to weeks after the onset of symptoms.
- HDV RNA testing may help to elucidate acute viral hepatitis cases of unknown etiology.
- Quantitative testing is used to monitor responses to anti-viral therapy.

**HDV genotype and subtypes**

- At least eight phylogenetically distinct genotypes have been identified with different geographical distributions. However, the genetic variability of HDV may be much more complex than previously thought.
- Test not widely available.

## Reference:

Negro F. Hepatitis D virus coinfection and superinfection. *Cold Spring Harb Perspect Med.* 2014;4(11):a021550.