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Viral Hepatitis

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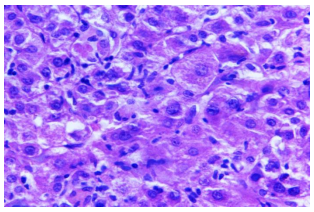
Several specific types of viral hepatitis are listed as notifiable conditions in Washington. In addition, other notifiable and non-notifiable conditions may cause hepatitis. Sorting out viral hepatitis is made more complicated due to multiple causes of hepatitis, confusing nomenclature, and limitations of laboratory diagnostics.

Background



Liver with acute hepatitis
www.cdc.gov

Hepatitis is literally inflammation (-itis) of the liver (Greek: hepar). Regardless of the cause, acute hepatitis implies there is detectable liver damage at the cellular level. Liver cells become distorted or destroyed and the normal liver structure is altered, but the liver had regenerative capacity and can usually recover. If there is ongoing exposure to a pathogen through a persistent infection or to a chemical agent, chronic hepatitis can develop cirrhosis with permanent scarring of the liver. Over time, cirrhosis carries the risk of liver failure or liver cancer.

The symptoms resulting from hepatitis can include pain and gastrointestinal symptoms as well as signs of reduced function of the liver. Failure to clear bilirubin results in its accumulation in the body, producing yellowing of the eye sclera, dark urine, and light stool. Accompanying the increase in bilirubin there are changes in other tests of liver function, particularly ALT and AST.

Five specific types of viral hepatitis are reportable. Other notifiable conditions can also cause hepatitis including relapsing fever (*Borrelia recurrentis*), leptospirosis, severe malaria, dengue hemorrhagic fever, Q fever, brucellosis, or typhoid. Non-reportable causes of hepatitis include other viruses like Epstein-Barr virus (infectious mononucleosis), as well as ascariasis, liver flukes, and bacteria sepsis. Hepatitis can result from gallstones, tumors, pancreatitis, certain metabolic diseases, some autoimmune or hereditary conditions, certain medications, herbal supplements, and a wide range of chemical agents and toxins (e.g., excessive alcohol consumption).

Viral Hepatitis

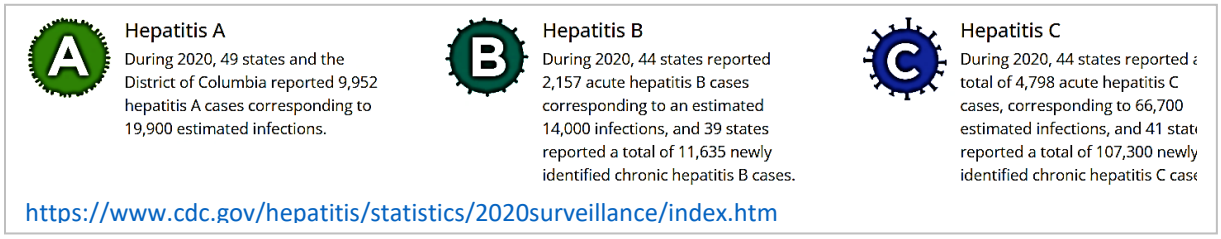
Epidemic hepatitis was recognized for millennia, often occurring as jaundice outbreaks during wars, and eventually "infectious hepatitis" was attributed to fecal-oral transmission. Starting in the late 19th century a different pattern of hepatitis spread was seen with therapeutic agents derived from human blood, termed "serum hepatitis". A few individuals developed more than two episodes of jaundiced illness, indicating that other communicable causes of hepatitis were likely.

The naming convention for viral hepatitis is confusing and unusual, applying letters A through E to the types as they were described. Hepatitis A is an RNA picornavirus, related to poliovirus. Hepatitis B is a DNA hepadnavirus. Hepatitis C is a flavivirus, related to the yellow fever virus. Less commonly seen are hepatitis D, an RNA deltavirus, and the RNA hepevirus hepatitis E. Note that another different set of unrelated syndromes were named in a similar way: the five rashes of childhood started with First disease (measles) and Second disease (scarlet fever) of which only the term Fifth disease (erythema infectiosum) is still in use.

The five unrelated viruses causing hepatitis produce indistinguishable illnesses, but the proportion of asymptomatic cases and the risk for chronic infection vary by type. Hepatitis A and hepatitis E generally do not cause chronic infections. Asymptomatic hepatitis A infection occurs mainly in early childhood while many adults have unrecognized hepatitis B or hepatitis C infections.

In the absence of diagnostic methods and unique clinical presentation, and before the scientific recognition of viruses, viral hepatitis was first described based on its epidemiology, specifically route of exposure, incubation period, and possibility of chronic infection. In addition, studies controversial even at the time involved deliberately infecting populations such as institutionalized children in order to observe routes of transmission, incubation periods, clinical illnesses.

Currently public health case investigations reflect the transmission routes. With hepatitis A, which has fecal-oral transmission, the major concerns are a potentially contaminated commercial product such as produce or transmission by an ill food handler at any food service establishment. For hepatitis B and hepatitis C, health care-associated infections are of particular concern as well as preventing perinatal hepatitis B transmission. Although surveillance results in 2020 may be skewed by changes in health care access and utilization due to COVID-19, hepatitis A was the most commonly reported type of viral hepatitis followed by hepatitis C. Newly identified chronic hepatitis C cases were ten times those of newly identified hepatitis B.



Viral Hepatitis Testing and Reporting

Identification of the different types of viral hepatitis progressed with electron microscopy and development of serologic tests. Serology distinguished hepatitis A and hepatitis B, leaving the remainder of cases categorized as non-A, non-B viral hepatitis. Eventually hepatitis C through E became testable. Other rare viruses could be added to the viral hepatitis alphabet in the future (hepatitis G is proposed), but names based on the viral agent would be less confusing.

The tests for acute viral hepatitis are most appropriate for a symptomatic person. Except for hepatitis A nucleic acids tests, the case definitions require a consistent illness to confirm acute viral hepatitis. False positive results are well documented for hepatitis A IgM in the presence of other liver disease or even advancing age. Hepatitis C testing is particularly complicated because several tests over time may be needed to distinguish between an acute and a chronic infection.

There is limited availability for genotyping and sequencing of viral hepatitis agents. Centers for Disease Control and Prevention can provide such testing during outbreak investigations. It is recommended that the local health jurisdiction contact the testing laboratory to hold serum for any hepatitis A case without a clear exposure such as travel. The same should be done for an acute hepatitis B or hepatitis C case with multiple medical procedures and no other identified risk factor.

Universal vaccination for hepatitis A or hepatitis B can provide immunity against infection; persons at increased risk should be specifically targeted for vaccination. Testing to identify and treat cases of hepatitis C can reduce long term complications including liver cancer (Table). Although very different agents, viral hepatitides represent ongoing public health challenges.

Priority Populations for Viral Hepatitis Prevention and Treatment

	Incidence (Acute)	Prevalence (Chronic)	Mortality
Hepatitis A	• People who use drugs • People experiencing homelessness	Not applicable	
Hepatitis B	• People who inject drugs	• Asian and Pacific Islander • Black, non-Hispanic	• Asian and Pacific Islander • Black, non-Hispanic
Hepatitis C	• People who inject drugs • American Indian/ Alaska Native	• People who inject drugs • Black, non-Hispanic • People born 1945–1965 • People with HIV	• American Indian/ Alaska Native • Black, non-Hispanic • People born 1945–1965

https://www.hhs.gov/hepatitis/viral-hepatitis-national-strategic-plan/priority-populations/index.html

Resources

CDC training for viral hepatitis serology:

https://www.cdc.gov/hepatitis/resources/professionals/training/serology/training.htm

CDC viral hepatitis resources for health professionals:

https://www.cdc.gov/hepatitis/hcv/hcvfaq.htm#section3

CDC viral hepatitis resources for the public:

https://www.cdc.gov/hepatitis/hcv/cfaq.htm