
a series of fact sheets written
by experts in the field of liver
disease

Extrahepatic Manifestations:

Non-Hodgkin's Lymphoma (NHL)

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Non-Hodgkin's lymphoma (NHL) is a form of cancer that starts in the lymphatic system. The lymphatic system is a network of lymph vessels that carry a clear fluid called lymph, made up of a type of white blood cells that fight infection. The lymphatic system is a circulatory system that collects white blood cells which are taken from veins, circulated throughout the body, and returned to the bloodstream. Once the lymphatic fluid is returned to the blood supply, the kidneys are responsible for removing the waste products. The fluid is spread throughout the body and stored in small round organs called lymph nodes. Lymph nodes are found in the neck, underarms, chest, abdomen and groin as well as the tonsils, spleen, appendix, and thymus. Moreover, there is lymphatic tissue in the stomach, skin and small intestine.

Typically, lymphoma occurs when white blood cells divide continuously without pause, which prevents them from maturing. This process can cause an overproduction of the immature cells which can crowd out the mature white blood cells, platelets and red blood cells.

Risk Factors

The designation "Non-Hodgkin's Lymphoma" encompasses a variety of cancers of white blood cells that affect the lymphoid tissues. The exact cause of these cancers is not fully understood but it is believed to be caused by an altered or depressed immune system.

There are also various types of infections that increase the risk of NHL including:

- Human immunodeficiency virus (HIV)
- Epstein-Barr virus (EBV)
- Helicobacter pylori (*H. pylori* – a bacteria that can cause stomach ulcers)
- Human T-cell leukemia/lymphoma virus (HTLV-1)
- Hepatitis C virus (HCV)

Usually lymphoma strikes adults, and as a person ages the chances of developing lymphoma increases. There is research being conducted on whether obesity and chemicals can cause NHL but these risk factors have not been confirmed.

NHL in people with hepatitis C is uncommon. Most studies show that the incidence of NHL in people with hepatitis C usually occurs after many years of on-going HCV infection and in people with hepatitis C who are older.

Symptoms

The most common symptoms of NHL include:

- Swollen but painless lymph nodes (generally in the neck, armpits and groin)
- Unexplained weight loss

- Fever
- Night sweats
- Coughing, trouble breathing, or chest pain
- Constant weakness and fatigue
- Pain, swelling, or a feeling of fullness in the abdomen

Diagnosis

If a person has the symptoms listed above, the next step would be to see a medical provider who will conduct a series of blood tests, physical tests, chest x-rays and possibly a biopsy to look at lymph tissue. If a diagnosis is confirmed a medical provider will need to perform various tests to establish the extent of NHL and what would be the best treatment for the type of NHL. A medical provider will also send a person to a provider that specializes in the treatment of NHL.

The HCV Connection

It is not fully understood how HCV causes NHL. There are theories that the virus might be the causative agent, or that the constant immune system stimulation from hepatitis C triggers NHL. However, we do know that the incidence of NHL in people with hepatitis C is higher than in the general population.

One very large study from Sweden of 27,150 HCV infected persons found that the incidence of NHL was nearly double in persons with hepatitis C who had been infected with hepatitis C for longer than 15 years. Other studies have found a similar or even a higher risk for HCV infected patients developing NHL. Smoking cigarettes also has been found to increase the risk of NHL even without hepatitis C. In 2005 a study from Italy linked smoking to the development of NHL. The same study found that people with hepatitis C who are heavy smokers have about a 4-fold increased risk for developing NHL.

Treatment


In people with NHL who have no symptoms treatment consists of closely monitoring NHL. Once someone starts to have symptoms or NHL starts to advance then treatment can include chemotherapy, therapy to boost the immune system (growth factors, vaccines, monoclonal antibodies, antibiotics for bacterial infections), radiation therapy, and stem cell transplantation. In people infected with hepatitis C, the treatment usually consists of treating the underlying disease – hepatitis C. There have been some studies which have found that interferon with or without ribavirin leads to a remission of NHL especially in people who achieve an SVR. But remission with treatment of interferon only occurred in the group who were infected with hepatitis C. This further supports the association between HCV and NHL.

Adapted from the National Cancer Institute www.cancer.gov

For more information about hepatitis C, hepatitis B and HCV coinfections, please visit www.hcvadvocate.org.

• *hcspFACTsheet* •
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