Lymphoma: Non-Hodgkin's 2.0 CE Hours

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Objectives:

1. Differentiate between Hodgkin's lymphoma and non-Hodgkin's lymphoma.

2. Examine the components of the lymphatic system.

3. Identify symptoms associated with non-Hodgkin's lymphoma.

4. Explore the staging system for non-Hodgkin's lymphoma.

5. Identify treatment options and prognosis for non-Hodgkin's lymphoma.

Lymphoma Overview

Lymphoma is a type of blood cancer that occurs when lymphocytes begin behaving abnormally. Lymphocytes are white blood cells that help protect the body from infection and disease and are an important part of the body's immune system. Abnormal lymphocytes may divide faster than normal cells or they may live longer than they are supposed to.

Lymphoma may develop in many parts of the body, including the lymph nodes, spleen, bone marrow, blood or other organs.

There are two main types of lymphomas: Hodgkin, often referred to as Hodgkin's disease or HL, and non-Hodgkin, referred to as non-Hodgkin's lymphoma or NHL. Both cancers cause similar symptoms but the diseases themselves are very different. The distinction between Hodgkin's disease and non-Hodgkin's lymphoma is made upon examination of the cancerous material (from a biopsy or aspiration of the tumor tissue). The type of

abnormal cells identified in the sample determines whether a lymphoma is classified as Hodgkin's disease or non-Hodgkin's lymphoma.

Hodgkin's Lymphoma (HL) –

Hodgkin's disease is much less common than non-Hodgkin's lymphoma. There are six types of Hodgkin's lymphoma, which account for about 1% of all cancers in the United States. The incidence of this cancer has actually been declining in recent years, in contrast to the increases in non-Hodgkin's lymphoma. The diagnosis of Hodgkin's disease is confirmed by visualizing tissue samples using a microscope and finding Reed-Sternberg cells.

Non-Hodgkin's lymphoma (NHL) –

Non-Hodgkin's lymphoma is more common than Hodgkin's disease. In the United States, non-Hodgkin's lymphoma is the sixth most common cancer among males and the fifth most common cancer among females. The incidence of non-Hodgkin's lymphoma has been steadily increasing over the last decades.

There are more than 61 types of NHL, some of which are more common than others. According to the American Cancer Society, a person has a 1 in 50 chance of developing non-Hodgkin's lymphoma.

Any lymphoma that does not involve Reed-Sternberg cells is classified as non-Hodgkin's lymphoma. The different types of non-Hodgkin's lymphoma have differences in their biologic behavior (such as an aggressive or slow growth rate), which affects prognosis. NHL is classified according to how fast the cancer spreads.

- NHL may be low grade (slow growing such as Follicular lymphoma), intermediate grade, or high grade (fast growing such as Burkitt's tumor).
- The cancer is further sub-classified by how the cells

look under the microscope (e.g., if there are certain proteins or genetic markers present).

The Lymphatic System

The lymphatic system is part of the body's immune system and helps fight infections, diseases, and filters out bacteria, viruses, and other unwanted substances. Because lymphatic tissue is found in many parts of the body, lymphoma can start almost anywhere.

- **Lymph vessels**: A system of vessels that branch out throughout the body similar to blood vessels.
- **Lymph**: A clear fluid (lymph) carried by the lymph vessels, which contains white blood cells (especially lymphocytes such as B cells and T cells). B cells produce antibodies that fight infections. This is the most common type of cell involved in NHL. T cells kill the foreign substances directly. NHL less frequently originates from T cells.
- **Lymph nodes**: Lymph vessels are interconnected to small masses of lymph tissue called lymph nodes, which are found throughout the body and store white blood cells. Collections of lymph nodes are found in the neck, underarms, chest, abdomen, and groin. When a person is sick, the lymph nodes are active and swollen and can be easily palpable.
- **Other parts**: The tonsils, thymus, and spleen are also part of the lymphatic system. Lymphatic tissue is also found in the stomach, skin, and small intestine.

Cause and Risk Factors of Non-Hodgkin's Lymphoma

The exact cause of NHL is not known. NHL may develop in people with weakened immune systems, such as after an organ transplant or in people with HIV.

NHL occurs when your body produces too many abnormal lymphocytes. In the normal life cycle of lymphocytes (a type of white blood cell), old lymphocytes die and your body creates new ones to replenish the supply. In NHL, lymphocytes grow indefinitely, so the number of circulating lymphocytes increases, filling up the lymph nodes and causing them to swell.

Symptoms

The symptoms of NHL depend on what area of the body the cancer affects and how fast the cancer is growing.

Symptoms may include:

- Abdominal pain or swelling, or a feeling of fullness in the abdomen may be seen, which may lead to a loss of appetite, constipation, nausea, and vomiting.
- Coughing, shortness of breath, trouble breathing or chest pain may occur if the cancer affects the thymus gland or lymph nodes in the chest, which may put pressure on the trachea
- Fever and chills that come and go
- Headache, concentration problems, personality changes, or seizures if the cancer affects cells in the brain
- Itching of the skin
- Lack of energy, fatigue that won’t go away
- Sweats- can be during the day or night
- Swollen, painless lymph nodes in the neck, armpits, or groin
- Unexplained weight loss

Diagnosing NHL

If the physician feels swollen lymph nodes, further testing may be needed to confirm a diagnosis such as:

- Lymph node biopsy- There are three ways to diagnose a lymph node: removal of the entire lymph node (excisional biopsy); partial removal of a lymph node (incisional biopsy); fine-needle aspiration (using a thin needle to remove some lymph node tissue) which is often not enough tissue to make a diagnosis.

- Bone marrow biopsy- A bone marrow biopsy can establish the spread of the disease. This involves the insertion of a needle into bone to obtain bone marrow. In adults, the most common site for this biopsy is the pelvic bone.

- Blood test to check protein levels, liver function, kidney function, and uric acid level
- Complete blood count (CBC)
- CT scans of the chest, abdomen and pelvis
- Gallium scan
- PET scan

Testing of DNA from the lymphoma is used to detect gene defects that help determine the prognosis and response to treatment. If tests reveal cancer, staging is done to help plan the treatment plan and give a prognosis. NHL is staged on a 1-4 scale and subcategories A and B:

- **Stage I**: The lymphoma cells are found in only one lymph node area (e.g., neck or axilla). Or, if the abnormal cells are not in the lymph nodes, they are in only one part of a tissue or organ (such as the lung, but not the liver or bone marrow).
- **Stage II**: The lymphoma cells are found in at least two lymph node areas on the same side of the body or only above or below the diaphragm. Or, the cells are in one organ and the lymph nodes affected are near that organ.
- **Stage III**: The lymphoma is in lymph nodes above and below the diaphragm. There might be spread into an organ near this lymph node group.
- **Stage IV**: In addition to lymph cell spread, lymphoma

cells are found in several parts of one or more organs or tissues.
- **A**: No symptoms
- **B**: Presence of any of the following symptoms: weight loss (10 % or more in the last six months), fever (greater than 101.5 F), night sweats, or severe itching.

Treatment

Treatment depends on the type and stage of cancer as well as age and overall health. Depending on the stage and type of NHL, treatment can include chemotherapy, biological therapy, stem cell transplant, and/or radiation therapy.

- Radiation therapy may be used for disease that is confined to one body area.
- Chemotherapy is the main type of treatment (usually several drugs in combination).
- Radioimmunotherapy may be used in some cases. This involves linking a radioactive substance to an antibody that targets the cancerous cells and injecting the substance into the body.
- Autologous bone marrow transplant using stem cells from the affected person is used when the NHL returns after treatment or does not respond to treatment.

Treatment for symptoms may include: platelet or red blood cell transfusions and antibiotics to fight infection.

Prognosis

Low-grade non-Hodgkin’s lymphoma usually cannot be cured by chemotherapy alone. However, the low-grade form of this cancer progresses slowly, and it may take many years before the disease gets worse or even requires any treatment.

Chemotherapy can often cure many types of high-grade lymphoma. However, if the cancer does not respond to chemotherapy drugs,

the disease can cause rapid death. Approximately 30 to 60 percent of patients with an aggressive form of non-Hodgkin's lymphoma can be cured.

The prognosis of NHL can be good but is linked to the type of lymphoma, the extent of spread (staging), and response to therapy. Approximately 66,000 patients were diagnosed with non-Hodgkin's lymphoma in 2011, and about 18,000 patients died in 2011.

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