Primary central nervous system (CNS) lymphoma is an aggressive form of non-Hodgkin lymphoma (NHL) in which malignant (cancer) cells are found exclusively in the central nervous system (the brain and spinal cord).

Primary CNS lymphoma can start in the brain, spinal cord, meninges (sheets of tissue that protect the CNS), or the eye (due to its proximity to the brain). When the lymphoma originated in other parts of the body and subsequently spread to the CNS, it is referred to as secondary CNS lymphoma. More than 95 percent of cases of primary CNS lymphoma are of B-cell origin.

The cause of primary CNS lymphoma is unknown, but having a compromised immune system (for example, people with acquired immunodeficiency syndrome [AIDS] or patients who have undergone organ transplant) may increase the risk of developing the disease. Having one or more of these risk factors does not mean a person will develop primary CNS lymphoma. Most people diagnosed with primary CNS lymphoma have never been exposed to any clearly identifiable risk factors.

The common symptoms of CNS lymphoma are focal neurological deficits based on which part of the CNS is involved by the cancer (such as language problems, weakness, paralysis, loss of vision), but headaches, vomiting, confusion, seizures, personality changes, and blurred vision can also occur. Symptoms can occur suddenly or develop over time.

Early recognition of symptoms and diagnosis of CNS lymphoma are critical, followed by prompt initiation of treatment in order to reverse neurological deficits and improve outcomes in this disease. Upon diagnosis, tests are done to find out how far the disease has spread within the CNS. These can include computed tomography (CT) or positron emission tomography (PET) scans, magnetic resonance imaging (MRI), lumbar puncture, and bone marrow biopsy. Primary CNS lymphoma usually does not spread beyond the CNS or the eye, but it often relapses (disease returns after treatment).

Various agents are being investigated in clinical trials for patients with newly diagnosed CNS lymphoma and those who are relapsed (refers to disease that reappears or grows again after a period of remission) or with refractory (disease does not respond to initial treatment) lymphoma. Some of the agents being investigated for the treatment of patients with CNS lymphoma include:

- Ibrutinib (Imbruvica)
- Lenalidomide (Revlimid)
- Nivolumab (Opdivo)
- Obinutuzumab (Gazyva)
- Pembrolizumab (Keytruda)
- Copanlisib (Aliqopa)
- Venetoclax (Venclexta)
- Bimiralisib
- Lisocabtagene maraleucel (Breyanzi)

Treatment options are changing as new therapeutics become available and current treatments are improved. Because today’s scientific research is continuously evolving, it is important that patients check with their physician or with the Lymphoma Research Foundation (LRF) for any treatment updates that may have recently emerged.

TREATMENTS UNDER INVESTIGATION

TREATMENT OPTIONS

Until the mid-1990s, radiation was the standard therapy for patients with CNS lymphoma. Now, high-dose methotrexate-based therapy with rituximab (Rituxan) is recommended for most patients. Sometimes, this is given in combination with other agents such as cytarabine (Cytosar), vincristine (Oncovin), procarbazine (Matulane), ifosfamide (Ifex), thiopeta (Tepadina), or temozolomide (Temodar). Furthermore, this initial treatment, or induction, is often followed by other therapy regimens, or consolidation, to reduce the risk of recurrence. These consolidation therapies include high-dose chemotherapy alone, such as cytarabine; cytarabine and etoposide (Etopophos, Toposar); high-dose chemotherapy (including thiopeta) with autologous stem cell transplant (patient’s own cells are infused after high-dose chemotherapy); or whole brain radiation therapy (WBRT). WBRT is seldom used in patients over the age of 65 because of permanent and progressive neurological complications (for example, loss of memory, problems with balance, or muscle coordination).

If lymphoma cells are found in the spinal fluid, chemotherapy may be delivered directly into the spinal fluid, in addition to the above chemoimmunotherapy regimens.
Clinical trials are crucial in identifying effective drugs and determining optimal doses for patients with lymphoma. Because CNS lymphoma is a rare disease, clinical trial enrollment is critical for establishing more effective, less toxic treatments. The rarity of the disease also means that the most novel treatments are often available only through clinical trials.

Patients interested in participating in a clinical trial should view the Understanding Clinical Trials fact sheet on LRF’s website (click here), and the Clinical Trials Search Request Form at lymphoma.org, talk to their physician, or contact the LRF Helpline for an individualized clinical trial search by calling (800) 500-9976 or emailing helpline@lymphoma.org.

Follow-up

Patients with CNS lymphoma should have regular visits with a physician who is familiar with their medical history and the treatments they have received. Medical tests (such as blood tests, MRI scans of the brain and/or spine) and eye (ophthalmological) examination may be required at various times during remission (disappearance of signs and symptoms) to evaluate the need for additional treatment.

Some treatments can cause long-term side effects or late side effects, such as memory problems, which can vary based on the duration and frequency of treatments, age, gender, and the overall health of each patient at the time of treatment. A physician will check for these side effects during follow-up care. Visits may become less frequent the longer the disease remains in remission.

Patients and their caregivers are encouraged to keep copies of all medical records and test results, as well as information on the types, amounts, and duration of all treatments received. This documentation will be important for keeping track of any side effects resulting from treatment or potential disease recurrences. LRF’s award-winning Focus On Lymphoma mobile app (lymphoma.org/mobileapp) and the Lymphoma Care Plan (lymphoma.org/publications) can help patients manage this documentation.

LRF appreciates the expertise and review of our Editorial Committee:

Leo I. Gordon, MD, FACP
Co-Chair
Robert H. Lurie Comprehensive Cancer Center of Northwestern University
Kristie A. Blum, MD
Co-Chair
Emory University School of Medicine

John Allan
Weill Cornell Medicine
Jennifer E. Amengual, MD
Columbia University
Jonathon Cohen
Emory University School of Medicine
Alex Herrera, MD
City of Hope
Shana Jacobs, MD
Children’s National Hospital
Manali Kamdar, MD
University of Colorado
Peter Martin, MD,
Weill Cornell Medicine
Anthony Mato, MD
Memorial Sloan Kettering Cancer Center
Neha Mehta-Shah, MD, MSCI
Washington University School of Medicine in St. Louis
Pierluigi Porcu, MD
Thomas Jefferson University

Contact LRF:
Helpline: (800) 500-9976
Email: helpline@lymphoma.org
www.lymphoma.org

Support through grants from: Bristol Myers Squibb, Genentech, Biogen

The Understanding Lymphoma series is published by the Lymphoma Research Foundation (LRF) for the purpose of informing and educating readers. Facts and statistics were obtained using published information, including data from the Surveillance, Epidemiology, and End Results (SEER) Program. Because each person’s body and response to treatment is different, no individual should self-diagnose or embark upon any course of medical treatment without first consulting with his or her physician. The medical reviewer, the medical reviewer’s institution, and LRF are not responsible for the medical care or treatment of any individual.

© 2021 Lymphoma Research Foundation

Stay Connected through our social media: