CONDITION

Primary lymphoma of the brain

Primary lymphoma of the brain is a cancer of immune cells that begins within the brain or other parts of the central nervous system.

WHAT IT IS
Lymphoma beginning in the brain or other central nervous system tissue

BODY SYSTEM
Nervous system

MAIN SYMPTOMS
Thinking changes, weakness, headaches, vision changes

WHAT CAUSES IT
Usually unknown; immune suppression increases risk

HOW IT IS DIAGNOSED
Contrast MRI and tissue biopsy, sometimes spinal-fluid or eye testing

MAIN TREATMENT
Methotrexate-based chemotherapy, often followed by consolidation treatment

CAN IT BE CURED?
Sometimes - treatment can produce lasting remission

IS IT AN EMERGENCY?
Sometimes - new seizure or sudden neurological loss

LONG-TERM OUTLOOK
Relapse is common, but lasting remission is possible

Overview

Primary lymphoma of the brain is usually called primary central nervous system lymphoma , or primary CNS lymphoma. It is a type of non-Hodgkin lymphoma that starts within the brain, spinal cord, coverings of the brain, eyes, or the fluid around the brain and spinal cord.

Lymphoma develops when white blood cells called lymphocytes grow out of control. Most primary CNS lymphomas arise from B lymphocytes, which normally help the immune system make antibodies.

This condition is different from lymphoma that begins elsewhere and later spreads to the brain. It is also different from cancers that begin in brain cells, such as gliomas.

Primary CNS lymphoma matters because it can affect thinking, movement, vision, and other

nervous system functions. It can grow over weeks or months, but it often responds to treatment. Some people enter a long-lasting remission, meaning that tests no longer show active lymphoma. The condition can return, so continued follow-up is important.

Symptoms

Symptoms depend on which areas of the nervous system are affected. They may develop gradually or become noticeable over a few weeks.

Changes in thinking or behaviour are common. You or people close to you may notice confusion, memory problems, reduced concentration, unusual sleepiness, or personality changes.

Other possible symptoms include:

Symptoms caused by lymphoma inside the eye may be mistaken for inflammation. They can include hazy vision, sensitivity to light, or dark specks called floaters.

These symptoms have many more common causes. Having one does not mean that you have lymphoma. New or worsening neurological symptoms still need medical assessment, especially if they affect everyday activities.

- Weakness, numbness, or poor coordination, often affecting one side
- Headache, sometimes with nausea or vomiting
- Difficulty speaking, walking, or keeping your balance
- Blurred vision, floating spots, or loss of vision
- Seizures
- New bladder or bowel problems if the spinal cord is involved

Causes and risk factors

In most people, there is no clear reason why primary CNS lymphoma develops. It is not caused by something you did, and it is not usually inherited.

A weakened immune system increases the risk. This may occur in people with untreated or advanced HIV infection, after an organ transplant, or during treatment that strongly suppresses the immune system.

In people with major immune suppression, the lymphoma is often associated with Epstein-Barr virus. This common virus usually remains inactive after infection, but it can contribute to

abnormal lymphocyte growth when immune control is weak.

Primary CNS lymphoma can also develop in people with no known immune problem. Increasing age is associated with a higher risk, although adults of different ages can be affected.

Diagnosis

Diagnosis usually begins with a neurological examination. This checks functions such as strength, sensation, balance, speech, reflexes, memory, and eye movements.

An MRI scan with contrast dye can show abnormal areas in the brain or spinal cord. The scan may strongly suggest lymphoma, but imaging alone usually cannot confirm it.

Confirmation most often requires a stereotactic biopsy. During this procedure, a neurosurgeon uses scan guidance to remove a small sample through a small opening in the skull. A pathologist examines the tissue to identify the type of lymphoma.

Corticosteroids like prednisone or hydrocortisone can quickly shrink CNS lymphoma and make a biopsy less likely to give a clear result. When it is medically safe, the specialist team may delay steroids until tissue has been collected. Steroids should not be withheld when they are urgently needed, and prescribed steroids should never be stopped without medical advice.

Other tests help find all affected areas and check whether lymphoma began outside the nervous system. These may include:

The results also show how well the kidneys, liver, heart, and other organs are working. This helps the team judge which treatments may be suitable.

- Eye examination with a slit lamp
- Lumbar puncture to test spinal fluid, when this can be done safely
- Blood tests, including testing for HIV
- PET or CT scans of the rest of the body
- Bone marrow or testicular assessment in selected cases

Treatment and management

Treatment is planned by specialists in blood cancers, brain and nerve conditions, cancer medicine, radiotherapy, and sometimes eye disease. The plan reflects where the lymphoma is located, your general health, kidney function, age, and ability to manage intensive treatment.

The main initial treatment is chemotherapy that can reach the brain. High-dose methotrexate

is central to many treatment plans. It may be combined with other chemotherapy medicines and rituximab, an antibody treatment that targets B lymphocytes.

Treatment is often divided into two stages. Induction treatment aims to bring the lymphoma into remission. Consolidation treatment aims to make that response last longer.

Consolidation may involve further chemotherapy, an autologous stem cell transplant, or whole-brain radiotherapy. In an autologous transplant, blood-forming stem cells are collected before intensive chemotherapy and returned afterward to help the bone marrow recover.

Whole-brain radiotherapy can control lymphoma, but it may cause delayed problems with memory, attention, balance, or mobility. These effects are a particular concern in older adults. Specialists weigh this risk against the expected benefit and may use a lower radiation dose in selected situations.

Surgery is usually used to obtain a biopsy rather than remove the whole tumour. CNS lymphoma may involve several areas and often responds better to treatment that reaches the entire nervous system.

Corticosteroids can reduce swelling and improve symptoms. Anti-seizure medicine may be used after a seizure, but it is not routinely needed by everyone.

Lymphoma involving the eyes may require treatment directed into the eye or radiotherapy, alongside treatment for the wider central nervous system.

If lymphoma returns, further treatment may still be possible. Options can include another methotrexate-based approach, different medicines, radiotherapy, stem cell transplantation, or a clinical trial. The choice is based partly on the first treatment and how long remission lasted.

Complications

The lymphoma can damage areas responsible for movement, speech, memory, behaviour, vision, or coordination. Some difficulties improve when treatment reduces the lymphoma, while others may continue.

Swelling in the brain can raise pressure inside the skull. This may cause worsening headache, vomiting, drowsiness, or neurological changes. Seizures and falls can also occur.

Treatment may lower blood cell counts, increasing the risk of infection, bleeding, or tiredness. Methotrexate and other medicines can affect kidney or liver function, so blood tests and supportive fluids are important parts of care. Some treatments can also affect nerves, hearing, fertility, or heart function.

Intensive chemotherapy and whole-brain radiotherapy may contribute to longer-term changes

in memory and concentration. Rehabilitation, occupational therapy, physiotherapy, speech therapy, and psychological support can help you adapt and recover skills.

Prevention

There is no established way to prevent most primary CNS lymphomas. Screening is not routinely available for people without symptoms.

Effective HIV treatment supports immune function and reduces the risk linked to severe HIV-related immune suppression. If you have received an organ transplant, your transplant team monitors the balance between preventing rejection and limiting complications from immune-suppressing medicines.

Do not reduce or stop immune-suppressing treatment yourself. Changes need careful supervision because they can have serious consequences, including organ rejection or worsening of an inflammatory condition.

Living with it and what to expect

Treatment usually takes place over several months. It may involve repeated hospital visits or admissions, scans, blood tests, and periods of recovery between treatment cycles. Fatigue can be substantial, and practical help with transport, meals, finances, or caring responsibilities may be useful.

Symptoms do not always recover at the same speed. Headache or weakness may improve quickly, while concentration, memory, balance, and confidence can take longer. Some people need rehabilitation before returning to work, driving, or living independently.

After treatment, follow-up generally includes appointments, neurological examinations, and repeat MRI scans. Eye or spinal-fluid assessment may be repeated when those areas were involved or symptoms suggest a problem. Follow-up is more frequent at first and usually becomes less frequent over time.

Remission may last for years, but relapse is common enough that new symptoms should be assessed rather than saved for the next routine appointment. Relapse can occur in the brain, spinal fluid, eyes, or other parts of the central nervous system.

Some people have lasting remission after initial treatment. Others need further treatment or live with ongoing neurological effects. Your likely course is shaped by your overall health, response to treatment, lymphoma biology, and which treatments you can safely receive.

When to get medical help

Arrange a prompt medical review if you develop persistent or worsening headaches, unexplained changes in memory or behaviour, new vision problems, increasing weakness, poor balance, or difficulty speaking. If you have completed treatment, report new neurological symptoms before your next routine follow-up.

Seek emergency help for:

During chemotherapy, follow the treatment unit's instructions for fever or signs of infection. Infection can become serious quickly when white blood cell levels are low.

- A first seizure or a seizure lasting several minutes
- Sudden weakness, facial drooping, or difficulty speaking
- Sudden severe confusion, collapse, or loss of consciousness
- A severe headache with repeated vomiting or increasing drowsiness
- Sudden major loss of vision

Common questions

Is primary CNS lymphoma a brain cancer?

Yes. It is a cancer affecting the central nervous system, but it begins in lymphocytes rather than in brain cells. This difference matters because its tests and treatment are not the same as those used for most other brain tumours.

Can primary lymphoma of the brain be cured?

Sometimes. Treatment can produce complete and lasting remission, but the lymphoma may return. Specialists may avoid using the word "cured" until a person has remained free of lymphoma for a long time.

Does it spread outside the brain?

Primary CNS lymphoma mainly stays within the brain, spinal cord, spinal fluid, and eyes. Lymphoma found elsewhere during the first assessment may mean it did not start in the central nervous system. Spread outside the CNS after treatment is possible but less typical than relapse within it.

Can the lymphoma be removed with surgery?

Usually not. It may be present in more than one area or extend into tissue that cannot be safely removed. Surgery is mainly used to collect a biopsy. Chemotherapy is generally the main

treatment because it can reach lymphoma cells in different parts of the nervous system.

How long can someone live with primary CNS lymphoma?

There is no single answer for an individual. Outlook is influenced by age, general health, immune function, lymphoma location, treatment options, and how well it responds. Some people have long remissions, while others experience early relapse or treatment complications. Your specialist can interpret these factors in the context of your results.

Is it the same as glioblastoma?

No. Glioblastoma develops from supporting cells in the brain, while primary CNS lymphoma develops from immune cells. They may cause similar symptoms or look similar on a scan, which is why a biopsy is often needed.

Sources

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