Optic Neuritis

What is optic neuritis?
Optic neuritis (ON) is a condition in which the nerve to the eye (the optic nerve) becomes inflamed or irritated. Inflammation refers to a process in which white blood cells and chemical messengers go to an area of the body to stimulate healing or to attack viruses or foreign material. Optic neuritis is a condition that can happen because of a disease or without any specific known cause.

Who gets optic neuritis?
This disease can happen to anyone at any age, but most cases occur in women who are between the ages of 20 to 40. In the United States, optic neuritis occurs more commonly in Caucasians than in African-Americans. ON is also more common in Asian cultures.

What are the symptoms of optic neuritis?
- Optic neuritis usually occurs in one eye, though occasionally both eyes are affected (about one in 10 times).
- Vision loss is common and typically occurs over a few days and stops progressing by one to two weeks.
- Symptoms include blurring of vision, a loss of part or all of central vision, reduced color vision, and dimness of vision.
- It may also be harder to see at night due to difficulty with contrast and glare.
- Most patients with ON have eye pain which is characteristically worse with movement of the eye.
- Sometimes people see flickering or flashing lights when they have optic neuritis (about one in three people).
- Some people notice that when they exercise or exert themselves their vision becomes blurrier.

How is the diagnosis of optic neuritis made?
The diagnosis of ON is based on the patient’s medical history, as well as the absence of other diseases which can cause visual loss. The ophthalmologic exam may help in showing abnormalities at the back of the eye in the optic disc, which is the part of the optic nerve visible using an instrument called an ophthalmoscope. There may be abnormalities of visual field testing, color vision, testing, and visual acuity testing that aid in the diagnosis.

Occasionally, other diseases have to be considered in diagnosing ON, but these are usually apparent during the history and examination. For example, some people who are older than 50 experience a sudden loss of vision in one eye which is due to a problem with blood flow to the eye, and not due to inflammation.

Is there any testing for optic neuritis?
Testing helps to exclude other diagnoses and evaluates the likelihood of other diseases. A
magnetic resonance imaging (MRI) study of the brain and orbits (the eye sockets) with gadolinium contrast may confirm the diagnosis of acute demyelinating optic neuritis. In addition, patients whose MRI scans show two or more areas of demyelination in the brain are now known to have a higher risk of going on to develop MS than patients with few or no such areas.

MRI scans let doctors look at the brain and spinal cord by way of a very powerful magnet that shows inner tissues. Gadolinium helps to indicate inflammation in the brain and optic nerve. Gadolinium should not be used in patients with significant kidney disease or known allergic reactions to dyes used in contrast material.

Lumbar puncture is usually not necessary for isolated optic neuritis, but is sometimes used in assisting with the diagnosis of multiple sclerosis. If there are unusual features of the ON-for example, patient age of less than 15 years, bilateral ON, or symptoms suggesting infection-lumbar puncture may be needed to check for other diseases.

Blood tests may be necessary in some people with optic neuritis depending on the situation. Diseases which can be checked with a blood test include, but are not limited to, lupus erythematosus, temporal arteritis, sarcoidosis, syphilis, and Lyme disease.

The visual evoked potentials test is non-invasive and measures how electricity is conducted along visual pathways. The test calls for the patient to watch a checkerboard pattern on a screen while electrodes monitor brain activity. With ON, there may be slowing in one or both optic nerves.

Ocular coherence tomography is a new non-invasive technique to evaluate the back of the eye. The test can measure the nerve fiber layer at the back of the eye. Ocular coherence tomography’s role in diagnosis ON is still unclear.

What causes optic neuritis?
Myelin is a material that is produced by oligodendrocytes (a type of cell) in the central nervous system. Myelin wraps around the axons of many nerves. It helps speed nerve activity and insulates electrical conduction in the nerves.

The most common cause for ON is inflammatory demyelination of the optic nerve. Demyelination is a process in which the myelin is stripped off by disease. It is believed that ON is an autoimmune process, where for some unknown reason the immune system attacks tissues of the body causing injury. While this may occasionally occur after an infection, there is often no clear reason why the immune attack occurs.

Some patients with ON will go on to have other episodes of demyelination in the nervous system and develop multiple sclerosis. Multiple sclerosis is an autoimmune condition in which attacks of demyelination occur in different parts of the brain and spinal cord over time.

What is the prognosis for optic neuritis?
In general, ON improves in about 80 percent of patients over a few weeks. Some people have continued visual change, reduced color vision, or more difficulty with night-time vision. Many have a complete resolution of their symptoms. Even if there is some residual vision loss, people regain functional vision and can read and pass a driving test.

Occasionally optic neuritis recurs and requires retreatment. A small group of patients has continued recurrence of ON and requires ongoing treatment. Over time, about 50 percent of patients with ON will develop other neurological symptoms suggesting multiple sclerosis. Patients with more severe ON may have a condition called neuromyelitis optica, which can be diagnosed with a blood test.
Is there any treatment for optic neuritis?

Optic neuritis may resolve spontaneously without treatment. However, if visual function is poor, a course of IV methylprednisolone (a steroid medication) with a tapering course of oral steroids afterwards has been shown to speed recovery of visual function. The usual course is three days of IV steroids followed by a few days of tapering medication. Side effects of steroids include:

- difficulty sleeping
- stomach upset
- a metal taste
- anxiety or irritability
- increased glucose levels (particularly in diabetics)
- thrush (a fungal infection)

Long-term steroids have other risks. Low dose oral prednisone is no longer used as it is not effective for optic neuritis.

If patients have multiple areas of demyelination on the MRI scans of the brain, there is some evidence that using medications that are effective in relapsing-remitting multiple sclerosis may make it less likely that the patients will develop MS.

Are there other sources of information about optic neuritis?

Here are some sources of information about optic neuritis:

- www.nmss.org
  National Multiple Sclerosis Society


- www.nanosweb.org
  North American Neuro-Ophthalmology Society

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