
UNIT 22 OPTIC NEURITIS AND CHORIO-RETINITIS

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22.0 OBJECTIVES

After going through this unit, you should be able to understand:

- optic neuritis;
- the clinical features of optic neuritis;
- the causes of optic neuritis;
- o differences between papillitis and retrobulbar neuritis; and
- o the oedema of optic nerve and its causes.

22.1 INTRODUCTION

During your training programme and field experience, you will come across patients with history of sudden loss of vision in one eye with no apparent pain and any visible redness or swelling of eyes. The loss of vision could range from partial to complete loss of vision with no perception of light. This could be a clear case of optic neuritis.

A patient presenting to you with diminution of vision and no improvement on refractive correction should be examined in detail. A careful retina examination with slit lamp microscopy. Biomicroscopy will help you identify the disc swelling, called papilloedema.

The cause of optic neuritis is not known in majority of cases. The other disorders associated with optic neuritis are various viral infections (chicken pox, mumps, measles. Contagious inflammation of meninges, orbit, sinuses and certain infections like syphilis, tuberculosis and intra ocular infections). Proper and early treatment of patients with optic neuritis can save and restore the vision of patient.

22.2 ANATOMY OF THE OPTIC NERVE

The second cranial nerve is called optic nerve, which is concerned with vision. It connects eye to the brain. Optic nerve is about 5 cm. Long and runs from optic disc to chiasma. The nerve can be divided into four parts:

- 1) Intra-ocular part - 1 mm.
- 2) Intra-orbital part - 25 mm.
- 3) Intra-osseous part - 4 to 10 mm,
- 4) Intracranial part - 10 mm long.

Each optic nerve contains more than 1 million nerve fibres. More than 90 per cent of these axons are fibres conducting impulses from the ganglion cells of the retina to the lateral geniculate body in the brain. Approximately 10 per cent of the axons appear to be the fibres that carry impulses from brain to the retina. The function of these efferent fibres is complex and poorly understood. Over 90 per cent of the axons in the optic nerve are of small calibre. They are thinly myelinated and less than 2 micron in diameter. The axons are grouped into bundles that run between interlocking framework of connective tissue septa. The supporting cells of the optic nerve, called neuroglia, are similar to those found in other parts of the central nervous system. The neuroglial cells are of 2 types – oligodendroglia and astroglia. In diseases of optic nerve, the astroglia increase in number and oligodendroglia decrease in number.

22.3 DISEASES OF THE OPTIC NERVE

The main disease of optic nerve is optic neuritis.

Optic Neuritis

Optic neuritis is an inflammatory or demyelinating disorder of the optic nerve. It can be divided to two types:

- 1) Papillitis – when the optic nerve head is inflamed.
- 2) Retrobulbar neuritis – when the nerve behind the eyeball is affected.

22.3.1 Papillitis

Inflammation of the optic nerve head is called Papillitis. It is visible on direct ophthalmoscope. It is common in children, although it can occur in adults also. It is characterized by disc swelling, obliteration of the physiological cup and visible vitreous cells. The disc is at first hyperemic (red in colour, due to increased vascularization) and the margins become blurred. Swelling and edema of the optic nerve head spreads to the neighbouring retina. The retinal veins become dilated, tortuous and distorted. Exudates accumulate upon the disc and in the retina, sometimes forming a macular fan or star.

When the retina is seriously involved, the condition is called neuroretinitis. In case of less severe infections, the optic disc may appear normal but in case of severe inflammation; it destroys the nerve fibres and present with a picture of optic atrophy.

Etiology

It is not always clear, Some septic condition like tonsillitis and sinusitis or general febrile illness may precipitate the lesion. Usually one eye is affected.

Symptoms

Rapid and marked fall of vision. It may be reduced to perception and projection of light only. But there is no pain in the eye.

Clinical Signs

- Pupil reaction to light becomes very sluggish and the reaction is not sustained.
- The optic disc becomes hyperaemic, the margins become blurred and later on the disc swells.
- The retinal veins are markedly congested.
- Flame-shaped retinal haemorrhages appear round the disc.
- There is no external sign.

Prognosis

If treated early, the inflammation subsides, appearance of the disc becomes normal and vision is regained. But if the disease is allowed to continue for sometime, the optic nerve undergoes atrophy.

Treatment

- a) Treatment of the cause, such as treatment of the septic focus.
- b) Injections of heavy doses of vitamin B1, B6, and B12, such as Neurobion daily for at least 20 days.
- c) Steroids (given orally and local eye drops or subtenon injections) and broad spectrum antibiotics by mouth.

22.3.2 Retrobulbar Neuritis

It is the inflammation of the optic nerve behind ophthalmoscopically visible area. It shows no visible changes on the optic nerve head (optic disc). It is more common in adults and is frequently associated with demyelination.

It may be acute or chronic.

Acute Retrobulbar Neuritis

Etiology

Septic focus, acute infectious diseases like diabetes, disseminated sclerosis and local inflammatory conditions like orbital cellulitis are the usual causes. Usually one eye is affected and it may occur in any sex.

Symptoms

The disease is usually unilateral, involving one of the eyes only.

Visual acuity impairment gradually increases and becomes maximal after 1-2 weeks and is usually between 6/18 to 6/60. It has a sudden onset. Although rarely, it may fall to total loss of vision with no perception of light:

- a) Rapid fall of central vision.
- b) Slight pain in and around the orbit.
- c) Pain on moving the eye upwards, because of the attachment of the sheath of the superior rectus muscle to the sheath of the optic nerve near the optic foramen. Pain is increased by pressure on the globe,

Clinical Signs

- a) Externally the eye is normal.
- b) The pupil reaction to light is very sluggish and the contraction is not sustained, so that instead of remaining constricted, the pupil slowly dilates even when the light is still kept on the eye.
- c) The field of vision may show a central scotoma (a black cloudy look).
- d) The fundus picture including the optic disc is normal. A few may show signs of papillitis.

Multiple sclerosis is a common idiopathic demyelination disorder of the central nervous system characterized by intermittent disturbance of the neurological functions. It does not affect the peripheral nervous system. The occurrence of retrobulbar neuritis should always excite the suspicion of the presence of multiple sclerosis,

Treatment

The treatment includes high dose of intravenous methyl prednisolone sodium followed by oral steroids. The treatment may speed up the recovery in about 2 weeks.

Prognosis

Prognosis is excellent for approximately 75 per cent of patients with recovery of vision to 6/9 or better. 85 per cent recover to 6/12 or more. However, other visual functions, e.g., colour vision, contrast sensitivity, light brightness appreciation often remain abnormal. A mild afferent pupillary conduction defect may persist and a mild optic atrophy may be seen. Recurrent attacks may lead to optic atrophy.

Chronic Retrobulbar Neuritis (Toxic Amblyopia)

This is a bilateral condition, caused by exogenous poisons, affecting primarily the ganglion cells of the retina. As there is atrophy of the macular fibres of the optic nerve, the condition was formerly known as chronic retrobulbar neuritis. But as the lesion is primarily in the retina, the toxic amblyopia is considered now a days as toxic retinoneuropathy.

Etiology

The toxic amblyopias are due to the following poisonous agents:

- a) Tobacco.
- b) Ethyl alcohol or a combination of both alcohol and tobacco.
- c) Methyl alcohol.
- d) Arsenic.
- e) Lead.
- f) Quinine.

Check Your Progress

1) Fill in the blanks:

- i) Optic neuritis is an inflammatory disease of
- ii) Ocular pain and tenderness is associated with and usually there is no pain or tenderness in.....
- iii) Inflammation and oedema of optic disc visible on direct ophthalmoscopy is seen in.....
- iv) The drug of choice in treatment of optic neuritis is

2) Answer in True/False:

- i) Disc swelling is noted in case of papillitis and disc may appear normal in retrobulbar neuritis. (T/F)
- ii) Etiology of optic neuritis in majority of patients is unknown. (T/F)
- iii) The standard treatment of optic neuritis is with antibiotics. (T/F)
- iv) Visual acuity in optic neuritis is normal. (T/F)

22.4 LET US SUM UP

This unit on optic neuritis and chorioretinitis is an attempt to give you a brief understanding of the diseases involving optic nerve. Optic neuritis is an acute inflammatory, immune related disorder of the optic nerve characterized by sudden diminution of vision. Though the exact cause in majority of cases is unknown, but it is believed that demyelination of the optic nerve leads to optic neuritis. Viral infections, granulomatous inflammations, tuberculosis and immune mediated inflammations are the other causes of optic neuritis. In next unit you will learn about infections of ocular adnexa.

22.5 ANSWERS TO CHECK YOUR PROGRESS

- 1)
 - i) Optic nerve
 - ii) Retrobulbar neuritis, Optic neuritis
 - iii) Sudden diminution of vision
 - iv) Systemic high dose of steroids
- 2)
 - i) T
 - ii) T
 - iii) F
 - iv) F