

Tips for management of normal tension glaucoma

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Confirm the diagnosis

As intraocular pressure (IOP) is in a statistically 'normal' range, the ability to identify a glaucomatous disc becomes a crucial first step so as not to miss normal tension glaucoma (NTG).

Look for evidence of glaucomatous optic nerve damage such as violation of the ISNT (Inferior > Superior > Nasal > Temporal) rule for neuroretinal rim thickness, notching, disc hemorrhages, and glaucomatous peripapillary atrophy (the size of which may correlate with the amount of rim loss in that region).

Vertical cup-disc ratio (VCDR) refers to the longest diameter of the disc and cup in the vertical meridian, which usually lies between 10 and 2 o'clock.

The VCDR should be interpreted with respect to the vertical disc diameter (VDD). If the VDD is large enough (e.g., >2.2 mm), a VCDR of 0.9 can still be normal. Advanced glaucomatous defects can occur in relation to a VCDR of 0.4 if the VDD is small enough (e.g., <1.1 mm).

Check the visual field loss according to the Anderson-Hodapp criteria to determine a glaucomatous visual field defect.

Get a good-quality (signal strength ≥ 7) retinal nerve fiber layer (RNFL) measurement on a Stratus optical coherence tomography (OCT) scan with a concentrically centered scan circle around the disc. Do not entirely rely on the color-coding of a Stratus OCT, but carefully evaluate the RNFL thickness curve. The key is to look for disc-field-OCT RNFL correlation.

Look for risk factors

Risk factors include risk factors for having the disease, risk factors for disease progression, and risk factors for treatment

inefficacy. These are outlined in the Review Article in this issue.¹

Differential diagnosis

- Previous optic neuritis — Ishihara test.
- Previous optic neuropathy of other causes.
- Previous uveitis with IOP rise, history of steroid use.
- A high index of suspicion for patients younger than 40 years, as NTG is a disease of elderly people.
- Consider other rarer possibilities, e.g., early retinitis pigmentosa, mitochondrial optic neuropathy, other retinal dystrophies such as cone-rod dystrophy.
- Electroretinogram (ERG)/visual evoked potentials/multifocal ERG/mitochondrial DNA testing would be helpful.

Management

Balance the benefits and risks of treatment. Balance aggressive IOP reduction with quality of life. Take into account the perceived life span of the patient as NTG often progresses slowly.

Aim to reduce IOP at least by 30%. This 30% refers to a comparison of the mean IOP during a few visits before starting treatment with the mean IOP for a few visits after starting treatment. Comparison of a single office IOP immediately before and immediately after starting treatment is not likely to be useful.

Take time to counsel patients, as the benefit of IOP reduction is not immediately obvious to them. However, in the long term, IOP reduction is sight saving.

In our experience, monotherapy alone is not likely to achieve adequate IOP reduction. Two or more glaucoma medications may be needed.

BRIEF REPORT

For patients taking antihypertensive medications, liaise with their physician to check for nocturnal blood pressure (BP) dips by using 24-hour ambulatory BP measurement. Liaise with other specialists to manage non-IOP-related factors such as obstructive sleep apnea.

Neuroimaging such as magnetic resonance imaging (MRI) and computed tomography (CT) of the brain is not mandatory. However, if the rim pallor is out of proportion to the VCDR, then imaging may help to rule out compressive optic neuropathy. We advocate MRI or CT to check for silent cerebral infarcts, which may be of prognostic value.

For patients whose condition deteriorates despite IOP levels in the low teens with maximum tolerated glaucoma medications, the IOP may need to be further decreased to a very low level by filtration surgery, which can be conveniently combined with cataract removal. The role of laser trabeculoplasty is uncertain and awaits further studies.

The role of ginkgo biloba extract awaits further studies. Some studies support its use for enhancing ocular blood flow. Ginkgo biloba should be used cautiously in patients taking anticoagulant therapy and those with known coagulopathy.

Reference

1. Leung DY, Chan PP, Tham CC, Lam DS. Normal tension glaucoma: risk factors pertaining to a sick eye in a sick body. *Hong Kong J Ophthalmol.* 2009;13:15-21.