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NON-ARTERITIC ANTERIOR ISCHEMIC OPTIC NEUROPATHY AFTER SILDENAFIL INTAKE ; CASE REPORT

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INTRODUCTION

Although Non-arteritic anterior ischemic optic neuropathy (NAION) is the most common acute optic neuropathy in people older than 50 years, it is actually a rare event in the general population.

It is characterised by sudden, usually painless, partial loss of vision in one eye,[1] which confers an increased risk of vision loss in the contralateral eye.[2] Although a definitive cause has not been determined, NAION is thought to occur following an idiopathic ischemic event involving the short posterior ciliary arteries that supply blood to the most anterior part of the optic nerve.[1]

Patients who have a 'disc at risk' or 'crowded disc' (small cup : disc ratio) [3] are at increased risk for developing NAION. In addition to a crowded disc, other established risk factors for NAION include age greater than 50 years and white race. Hypertension and diabetes also predispose to NAION development.[4] Other factors that have been hypothesised to associate with NAION include high cholesterol, arteriosclerosis, stroke, cardiac and intraocular surgery, tobacco use, nocturnal hypotension, blood loss, glaucoma, elevated homocysteine and sleep apnea.[1]

Many of the risk factors for developing NAION also predict the occurrence of erectile dysfunction (ED), such as hypertension, diabetes, hyperlipidemia and smoking.[5–7] Oral phosphodiesterase 5 inhibitors such as sildenafil citrate (Viagra_, Pfizer Inc, New York, NY, USA) are the first-line treatment for ED in patients without contraindications.

Studies have shown therapeutic doses of sildenafil (25–100 mg) reduce mean peak systolic and diastolic blood pressures by approximately 10 mm Hg.[8] Patients with vasculopathy who also take antihypertensive medications, including or PDE-5selective inhibitors may be at increased risk for NAION due to nocturnal hypotension.[9]

CASE REPORT

A 47 yr male presented with diminution of vision in right eye from last 3-4 days, which was sudden in onset, gradually progressive and painless in nature.

There was no history of redness, watering, photophobia , floaters or flashes of light.

Patient gave history of sildenafil (50 mg) intake 1 tab 1 day prior to the onset of symptoms.

There was no history of hypertension, type 2 DM , coronary artery disease.

There was no history of similar attacks in past.

On examination his best corrected visual acuity was 6/6 in both eyes and relative afferent pupillary defect was present in right eye .IOP was 14 mm Hg in right eye and 13 mm Hg in left eye. Ocular motility was normal. Anterior segment was normal in both eyes on slit lamp examination. On fundus examination disc oedema was present in right along with superficial haemorrhages in peripapillary area (figure 1) while optic disc and macula was normal in left eye (figure 2). colour vision was defective in right eye , while normal in left eye. Only central vision was spared and rest of the field was defective on visual field charting (30-2) done with the help of Humphery's Automated perimeter in the right eye (figure 3)and in left eye visual field was normal.

Blood investigations which included complete hemogram with ESR , FBS , HbA1c and lipid profile were normal. His BP was 130/84 mmhg and pulse was 78 beats per minute .

Discussion

Nonarteritic anterior ischemic optic neuropathy is not an uncommon disorder with an annual incidence of 2.3 to 10.2 per 100,000 persons over 50 years of age, and 0.54 per 100,000 for all ages.[8,9] In the Ischemic Optic Neuropathy Decompression Trial, 60% of patients with NAION had conditions associated with small-vessel occlusive cerebrovascular disease, including hypertension, diabetes, and cigarette use.[1]

Hayreh [2] suggested that the problem is localized to the posterior ciliary arteries in the disc and the retrolaminar area. In 1970, he showed that the circulation in the optic disc, peripapillary choroid, and choroid is dependent upon the difference between the intraocular pressure and perfusion pressure in the posterior ciliary arteries.

When an imbalance results, as in a sudden and marked systemic arterial hypotension, AION may result. Hoyt [4] was the first researcher to note that some discs have certain anatomic features that seem to predispose them to AION. Burde [3]coined the term “disc at

risk” to describe these structurally crowded discs characterized by a small nerve head with a small or absent physiologic cup, abnormal branching of the central vessels, and full nerve fiber bundles obscuring the disc margin.

The role sildenafil may play in causing injury to the optic nerve is not known. Sildenafil citrate is a selective phosphodiesterase 5 inhibitor, and its mechanism of action works through the nitric oxide-cyclic GMP pathway. Nitric oxide has been implicated as a possible toxic agent to the optic nerve and to retinal ganglion cells, and has been

implicated in the pathogenesis of glaucoma, a more common form of optic neuropathy than NAION.[5] Inhibition of nitric oxide synthetase in an animal model for glaucoma rescued retinal ganglion cells from damage and has been suggested as a means of neuroprotection for the optic nerve. [6]

In patients with a predisposing diabetic condition, Sildenafil intake can cause changes in NO balance altering the normal vascular autoregulation so that the ocular circulation may not be able to compensate for a drop in systemic blood pressure. Moreover, the indirect involvement of Sildenafil in the NO system with effects on inducible NO synthase and the VEGF signalling pathway may lead to leukocyte vascular adhesion, downregulation of tight junction protein, and breakdown of the blood-ocular barrier leading to NAION damages. [7]

Conclusion

Sildenafil intake is associated with risk of developing NAION and patients with small cup to disc ratio, Hypertensive and diabetes are associated with higher risk.

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