

# A case of nonarteritic anterior ischemic optic neuropathy of a male with family history of the disease after receiving sildenafil

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**Abstract:** A 51-year-old male was referred to the University Eye Clinic of Ioannina with nonarteritic anterior ischemic optic neuropathy (NAION) 12 hours after receiving sildenafil citrate (Viagra®). Examination for possible risk factors revealed mild hypercholesterolemia. Family history showed that his father had suffered from bilateral NAION. Although a cause-and-effect relationship is difficult to prove, there are reports indicating an association between the use of erectile dysfunction agents and the development of NAION. Physicians might need to investigate the presence of family history of NAION among systemic or vascular predisposing risk factors before prescribing erectile dysfunction drugs.

**Keywords:** sildenafil, nonarteritic anterior ischemic optic neuropathy, erectile dysfunction drugs, family history

## Case report

A nonsmoker 51 year-old man used sildenafil citrate (Viagra®) for erectile dysfunction. The patient did not clarify the quantity of the drug that he used the previous day, but he mentioned during history recording that he had been using this specific agent for the last 6 months at least once a week. The patient did not receive any other treatments before this attack.

The following morning, he noted painless blurred vision in his right eye and he was referred to the University Eye Clinic of Ioannina. Ophthalmologic examination revealed a corrected visual acuity of 1/10 for the right eye and 10/10 for the left eye. Examination of the pupils showed a relative afferent pupillary defect of the right pupil. Biomicroscopy of the anterior segment did not show any pathological manifestations. Intraocular pressure was 12 mmHg for both eyes. The color vision score for the affected eye was 10 out of 15 Ishihara plates while the unaffected eye had a score of 15 out of 15.

Dilated fundus examination revealed swelling of the right optic disk while the vessels, macula, and the peripheral retina were normal. Goldmann perimetry showed superior visual field loss of the right eye. Fluoroangiography revealed hyperfluorescence of the right optic disk and leakage from it, indicating edema. The patient was not hyperopic and the cup-to-disk ratio in the fellow eye was 0.3.

Laboratory tests excluded diabetes, sarcoidosis, blood dyscrasias, and hypercoagulable states. Syphilis screening tests, antinuclear antibodies, antinuclear cytoplasmic antibodies, and anticardiolipin antibody tests were all negative. In addition, laboratory screening revealed that erythrocyte sedimentation rate, C-reactive protein, and blood

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count were in the normal range. There was, however, mild hypercholesterolemia (220 mg/dL). Chest radiography was normal. A magnetic resonance image scan of the brain and orbits with gadolinium demonstrated normal optic nerves and no white matter lesions. A Doppler ultrasound of the carotid arteries and neurological examination were also normal.

The above mentioned results led to the conclusion that the patient had experienced a NAION attack on his right eye. He was consulted to discontinue the use of sildenafil citrate. The patient was subjected to three subtenon injections of beta-methoxazone with a 20-day interval in between.

Visual acuity at the last follow-up evaluation, 1 year after the initial attack, improved to 8/10 for the right eye with ensued optic disk atrophy yet without any significant improvement concerning the impaired visual field.

## Discussion

NAION is the most common acute optic neuropathy in older age groups with an estimated annual incidence of 2.3 per 100,000.<sup>1,2</sup> It is presumed to result from circulatory insufficiency within the optic nerve head, but the specific mechanism of the vasculopathy remains unproven. Therefore, the most important considerations in understanding the development of NAION are the factors that influence blood flow in the optic nerve head.

Hypovolemia, mainly due to severe surgical procedures,<sup>3,4</sup> atherosclerotic risk factors,<sup>5</sup> hypercoagulable states,<sup>6–8</sup> and crowded optic disk,<sup>9</sup> in possible combination with regional vascular endothelial disorders has been implicated in the pathophysiology of NAION.

Over the last few years there has been an increasing number of case reports concerning patients who have developed NAION soon after the use of sildenafil and other phosphodiesterase type 5 inhibitors.<sup>10–13</sup> It has been hypothesized that these agents might exaggerate the physiologic nocturnal hypotension resulting in ischemia to the optic nerve head or that they might interfere with the autoregulation of blood flow thereby decreasing perfusion to the optic nerve head.<sup>14</sup> In most of the reported cases of NAION after the use of sildenafil, patients detected visual loss upon awakening in the morning. It is usually described 6–36 hours after use of the agent, as it was in this case.

The majority of affected users of phosphodiesterase type 5 inhibitors suffer already from other possible risk factors for NAION. In a retrospective matched case-control study, 38 patients with NAION and age-matched controls without previous history of NAION were questioned for the use of erectile dysfunction agents. The study showed that

men with a history of myocardial infarction or hypertension are at increased risk for NAION when using sildenafil or tadalafil.<sup>15</sup>

In this case, the patient had mild hypercholesterolemia without any other systemic or vascular predisposing risk factors based on clinical examination and the rest of the screening as described above. However, the family history of his father having suffered from bilateral attacks of NAION indicates the possible presence of anatomical or other unidentified risk factors for the development of NAION.

The role of hereditary factors in familial NAION remains unknown and the only clinical difference between classical and familial NAION is that the familial type seems to have an earlier onset and a higher frequency of bilateral disease.<sup>16</sup>

This case might support all previous indications of the association between NAION and the use of erectile dysfunction drugs. Since it seems that sildenafil can provoke NAION in some individuals who have a risk profile, the physician might need to investigate the presence of a family history of NAION among other risk factors before prescribing erectile dysfunction drugs.

## Disclosure

The authors report no conflicts of interest in this work.

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