

Non-Arteritic Anterior Ischaemic Optic Neuropathy Associated with Semaglutide use

M. Kearney^{1,2}, N.M. Smyth^{2,3}, H.S.A. Hassan¹, M.S. Khan¹.

1. Department of Medicine for the Elderly, Beaumont Hospital, Beaumont Rd., Beaumont, Dublin 9, Ireland.
2. Department of Surgery, Royal College of Surgeons Ireland, St Stephen's Green, Dublin 2, Ireland.
3. Department of Surgery, Connolly Hospital, Mill Rd., Blanchardstown, Dublin 15, Ireland.

Abstract

Presentation

Non-arteritic ischaemic optic neuropathy (NAION) is a common cause of acute, painless monocular visual disturbance in older adults. This case discusses a woman in her 70s with vascular risk factors who presented with a three-day history of progressive left sided visual disturbance. Examination demonstrated a left relative afferent pupillary defect and inferior quadrantanopia.

Diagnosis

Haematological investigations and neuroimaging were unremarkable. Formal ophthalmological assessment demonstrated superior optic disc swelling with an inferior visual field defect, consistent with NAION.

Treatment

The patient had been taking semaglutide, as prescribed, for the six months prior to presentation. This was identified as a potential contributory agent and was discontinued. Visual acuity partially improved following cessation of semaglutide.

Discussion

This case seeks to highlight a possible association between semaglutide use and NAION. Although causality remains unproven, it underscores the importance of pharmacovigilance when managing patients presenting with ophthalmological symptoms.

Introduction

Non-arteritic ischaemic optic neuropathy (NAION) causes painless, sudden, monocular vision loss and its risk factors include hypertension, type 2 diabetes mellitus and hyperlipidaemia¹. Recently more attention has been brought to pharmacologic agents being a factor in optic nerve ischemia. Glucagon-like-peptide-1 (GLP-1) receptor agonists are being increasingly utilised for their glycaemic control and weight management effects. However, isolated case reports have suggested a link between NAION and semaglutide use²⁻⁴.

The pathophysiology underpinning this phenomenon is not fully understood. Existing literature hypothesises that it is due to nocturnal hypotension, rapid glucose correction, anatomical variation, and the presence of GLP-1 receptors in retinal ganglion cells. While causality remains unproven, the findings warrant further investigation particularly as the use of semaglutide increases²⁻⁴.

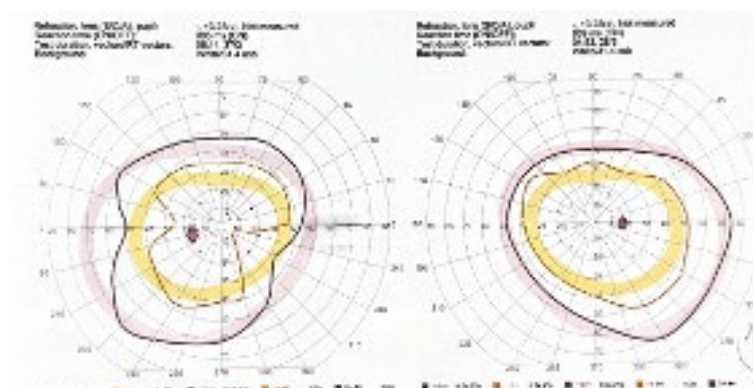
Case Report

A female patient in her 70s with atrial fibrillation, type 2 diabetes mellitus, hypertension, and dyslipidaemia presented to the emergency department with a 3-day history of painful progressive vision loss in the left eye associated with right occipital headache. She described inferior visual field loss. No other lateralising neurological symptoms were identified. She was afebrile and hemodynamically stable. Examination showed a left relevant afferent pupillary defect, inferior quadrantanopia and reduced visual field acuity (right 6/12, left 6/60) (Figure 1). Fundoscopy demonstrated oedema and pallor of the left optic disc. Respiratory and cardiovascular examination were unremarkable.

A broad differential diagnosis was considered, primarily arteritic vs non-arteritic optic neuropathy. Haematological investigations, including full blood count, renal, liver, autoimmune, vasculitis, infectious, and nutritional panels, were unremarkable. Magnetic resonance imaging (MRI) and computed tomography (CT) of the brain, including angiography, excluded intracranial pathology such as occipital infarction and carotid or intracranial vascular disease.

Careful interrogation of the medication history revealed semaglutide use for the previous 6 months for glycaemic control. Endocrinology consult was sought which detailed emerging reports of GLP-1 receptor agonist-associated optic neuropathy, on this basis semaglutide was discontinued, and diabetes management was modified to metformin 500mg twice daily and linagliptin 5mg once daily. Over subsequent weeks, visual acuity improved and there was resolution of optic disc swelling. Glycaemic control remained satisfactory on her new diabetic therapy regimen. The patient is undergoing continued outpatient ophthalmology review.

Figure 1: Goldmann perimetry visual field testing. This figure demonstrates an inferior altitudinal field deficit in the left eye consistent with characteristics of non-arteritic anterior ischemic optic neuropathy. The right eye demonstrates mostly preserved visual fields.



Discussion

Emerging literature has raised potential associations between semaglutide and NAION. This is based on isolated case reports and pharmacovigilance data²⁻⁴. Suspected mechanisms include rapid glycaemic normalisation; nocturnal hypotension related to weight loss and altered perfusion mediated by GLP-1 expression in retinal ganglion cells²⁻⁴. While causality remains unproven, this case demonstrates the need for further investigation in semaglutide potential implication in the causality of NAION in susceptible patients.

This case highlights important learning points, firstly NAION should be considered in patients with acute, painless vision loss, particularly in those with vascular risk factors such as hypertension and diabetes. Secondly, distinguishing arteritic from non-arteritic causes of optic neuropathy is crucial, as the management and risk of permanent vision loss differ based on underlying pathology. Lastly, though further reporting and investigation of the phenomenon is required, GLP-1 agonists may emerge as a cause of NAION. Thorough pharmacovigilance and multidisciplinary collaboration are key in evaluating unexplained visual symptoms, especially as the use of GLP-1 agonists, including semaglutide, increases.

Declarations of Conflicts of Interest:

None declared.

Corresponding Author:

Mark Kearney,

Department of Surgery,
Connolly Hospital,
Mill Rd.,
Blanchardstown,
Dublin 15,
Ireland.

E-Mail: mark.kearney90@gmail.com

References:

1. Salvetat ML, Pellegrini F, Spadea L, Salati C, Zeppieri M. Non-Arteritic Anterior Ischemic Optic Neuropathy (NA-AION): A Comprehensive Overview. *Vision (Basel)*. 2023;7(4).
2. Amini A, Hamann S, Larsen M. Semaglutide and non-arteritic anterior ischaemic optic neuropathy: Review and interpretation of reported association. *Acta Ophthalmol*. 2025;103(6):615-21.
3. Hidalgo Ramos RA, Ortiz M, Dufner Krieger S, Secades D. Semaglutide and Non-arteritic Anterior Ischemic Optic Neuropathy: A Systematic Review. *Cureus*. 2025;17(8):e89656.
4. Simonsen E, Lund LC, Ernst MT, Hjellvik V, Hegedüs L, Hamann S, et al. Use of semaglutide and risk of non-arteritic anterior ischemic optic neuropathy: A Danish-Norwegian cohort study. *Diabetes Obes Metab*. 2025;27(6):3094-103.