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M Lockhart and others

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Central serous chorioretinopathy secondary to intramuscular testosterone therapy

M Lockhart[1], **E Ali**[1], **M Mustafa**[1], **W Tormey**[1], **S Sreenan**[1], **A Saaed**[2] and **JH McDermott**[1]

[1]Academic Department of Endocrinology and Pathology, Connolly Hospital Blanchardstown/RCSI, Lucan, Ireland and [2]Ophthalmological Surgery Department, Hermitage Medical Clinic, Lucan, Ireland

Correspondence should be addressed to M Lockhart
Email
lockhamj@tcd.ie

Summary

A patient treated with intramuscular testosterone replacement therapy for primary hypogonadism developed blurred vision shortly after receiving his testosterone injection. The symptom resolved over subsequent weeks and recurred after his next injection. A diagnosis of central serous chorioretinopathy (CSR) was confirmed following ophthalmology review. A decision was made to change the patient's testosterone regime from this 12-weekly intramuscular injection to a daily topical testosterone gel, given the possibility that peak blood levels of testosterone following intramuscular injection were causing his ocular complaint. His CSR did not recur after this change in treatment. CSR secondary to testosterone therapy is a rare finding but has been reported previously in the literature.

Learning Points

- Blurred vision in patients treated with testosterone replacement therapy (TRT) should prompt an ophthalmology review.
- The potential for reduced risk of central serous chorioretinopathy (CSR) with daily transdermal testosterone remains a matter of conjecture.
- CSR is a rare potential side effect of TRT.

Background

This case adds to the literature regarding central serous chorioretinopathy (CSR) as a rare side effect of testosterone replacement therapy (TRT). It supports the hypothesis that daily transdermal testosterone replacement rather than periodic intramuscular replacement therapy may reduce the risk of CSR, possibly due to the avoidance of peaks in blood levels of testosterone with daily therapy.

Case presentation

A 28-year-old male with a history of primary hypogonadism presented to his optician complaining of blurred vision in his right eye. Primary hypogonadism secondary to bilateral anorchidism had been diagnosed in childhood, and intramuscular testosterone injections had been commenced at the age of 10. He had been well at most recent outpatient reviews, with normal testosterone levels on testosterone undecanoate (Nebido) 250 mg every 12 weeks. He had no other past history and was taking no other medications. He reported that the blurred vision occurred shortly after receiving his testosterone injection, resolved over subsequent weeks, and recurred after his subsequent injection. Trough testosterone levels at the time were 18.5 nmol/L (8.6–29.0 nmol/L). Initial ophthalmological assessment 1 week after testosterone injection revealed right-sided CSR, with subretinal fluid detected on optical coherence tomography (OCT) scan. The left eye was unremarkable, visual acuity was normal bilaterally, and there was no choroidal neovascularization on OCT angiography. The patient was treated with

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Nepafenac eye drops for 8 weeks. A repeat OCT scan, approximately 7 weeks post-testosterone injection, showed resolution of the subretinal fluid. A decision was made to change the patient's testosterone regime from a 12-weekly intramuscular injection to a topical testosterone gel, given the possibility that peak blood levels of testosterone following intramuscular injection were causing his ocular complaint. His symptoms did not recur in the months following this change in testosterone replacement regime, and he remains clinically well. Testosterone levels 3 months after switching to topical testosterone gel were 12.4 nmol/L (8.6–29.0 nmol/L).

Discussion

CSR is a rare but potentially serious complication of TRT (1, 2, 3, 4). CSR is characterized by a buildup of fluid which leaks from the choroid under the retina causing visual disturbance. This fluid can separate the retina from the choroid. Choroidal vascular hyperpermeability and retinal pigment epithelium dysfunction have been postulated to play a role in the development of CSR. Management is usually conservative, but in some persistent cases laser, pharmacological or phototherapy can be used.

TRT is indicated in male patients with clinical and biochemical evidence of hypogonadism to achieve testosterone levels within the normal reference range. TRT alleviates the symptoms and complications of hypogonadism, including low libido, decreased morning erections, gynecomastia, low mood, and reduced bone mineral density. TRT can be administered topically, intramuscularly, subcutaneously, or orally.

CSR is a rare side effect of TRT (1, 2, 3, 4). The exact mechanism is unclear, but it is postulated that exogenous testosterone may cause increased choroidal blood flow and permeability and potentially interact with retinal pigment epithelium via androgen receptors (2).

Intramuscular testosterone treatment is associated with fluctuations in plasma testosterone levels, with a peak level shortly after the dose is administered, falling to a trough level before the subsequent dose is administered. Our patient's symptoms seemed to mirror this rise and fall in blood testosterone levels, with symptoms occurring shortly after his injection, resolving over time, and then recurring after a subsequent injection. Since he switched to daily transdermal TRT, his symptoms have not recurred. Although cases of CSR associated with administration of daily oral and topical TRT have also been described (1, 3), our case supports the contention that higher peak testosterone levels following administration of exogenous intramuscular testosterone can lead to the development of CSR. Blurred vision in patients treated with testosterone should prompt an ophthalmology review.

Declaration of interest
The authors declare that there is no conflict of interest that could be perceived as prejudicing the impartiality of the research reported.

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Patient consent
Written informed consent for publication of the patient's clinical details was obtained.

Author contribution statement
M Lockhart is the primary author, wrote the case report, undertook the literature review relative to the case, and provided endocrine clinical care and follow-up for the patient. M Ali, M Mustafa, W Tormey, and S Sreenan provided expert input into the writing and editing of the case report. S Saeed provided ophthalmology clinical care for the patient and contributed to the writing of the case report. JH McDermott supervised the case report and provided endocrine clinical care and follow-up for the patient.

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