gradually recovered over the following 10 months to 6/9 with eventual resolution of the CMO.

Comments

Vitrectomy[1] and intravitreal steroid injection (triamcinolone)[2,3] have both been advocated in the management of refractory CMO. However in this case, neither the vitrectomy itself nor the intraocular steroid exposure seemed to have any beneficial effect on the CMO. In fact, the suggested safe dose for intraocular administration of the triamcinolone preparation is almost 20-fold less than that of the steroid injected in this case.[4]

To our knowledge, there have only been 13 cases of inadvertent intraocular depomedrone injections reported.[5–10] Many were managed conservatively, which mostly lead to serious complications such as ascending optic atrophy.[5,6] Vitrectomy has been regarded as the treatment of choice for the last 15 years or so. Previous reports advocate immediate vitrectomy to achieve better prognosis;[10] our case was operated on over 48 h following the injection and the visual outcome was satisfactory. This suggests that the intraocular residence time of the depomedrone may not have an adverse effect on visual outcome, although longer residence times may be associated with an increased incidence of complications such as those noted in conservatively managed cases.

The incidence of perforation during peribulbar injection of local anaesthetic has been reported up to 1 in 874.[11] In order to try and reduce perforation rates, alterations in technique have been suggested such as watching for corresponding globe movement whilst performing horizontal movements of the needle. This is done following needle insertion but prior to injection.[12] The introduction of newer techniques of periocular steroid administration, such as blunt cannula subtenon injection, avoids the need to introduce a sharp instrument into the orbit, thereby reducing incidences of inadvertent ocular perforation.

References

1 Pendergast SD, Margherio RR, Williams GA, Cox MS Jr. Vitrectomy for chronic pseudophakic cystoid macular oedema. *Am J Ophthalmol* 1999; 128(3): 317–323.
2 Antcliff RJ, Spalton DJ, Stanford MR, Graham EM, Ffytche TD, Marshall J. Intravitreal triamcinolone for uveitic cystoid macular oedema: an optical coherence study. *Ophthalmology* 2001; 108(4): 765–772.
3 Martidis A, Duker JS, Greenberg PB, Rogers AH, Puliafito CA, Reichel E *et al*. Intravitreal triamcinolone for refractory diabetic macular odema. *Ophthalmology* 2002; 109(5): 920–927.
4 McCuen BW, Bessler M, Tano Y, Chandler P, Machemer R. The lack of toxicity of intravitreally administered triamcinolone acetate. *Am J Ophthalmol* 1981; 92: 625–627.
5 Giles CL. Bulbar perforation during periocular injection of corticosteroids. *Am J Ophthalmol* 1974; 77: 438–441.
6 Schlaegel TF, Wilson FM. Accidental intraocular injection of depot corticosteroids. *Ophthalmology (Rochester)* 1974; 78: 847–855.
7 Zinn KM. Iatrogenic intraocular injection of Depocorticosteroid and its surgical removal using the pars plana approach. *Ophthalmology (Rochester)* 1981; 88: 13–17.
8 Moschicci GB. Incidental introduction of a long-acting corticosteroid in the vitreous humour. *Boll Oculist* 1969; 48: 426–432.
9 McLean EB. Inadvertent injection of corticosteroid into the choroidal vasculature. *Am J Ophthalmol* 1975; 80: 835–837.
10 Andrew NC, Gregor ZJ. Intraocular injection of Depomedrone. *Br J Ophthalmol* 1986; 70: 298–300.
11 Gillow JT, Aggarwal RK, Kirkby GR. A survey of ocular perforation during ophthalmic local anaesthetic in the United Kingdom. *Eye* 1996; 10: 537–538.
12 Kraushar MF, Cangemi FE, Morse PH. Prevention of accidental intraocular injection following inadvertent needle perforation of the eyeball. *Ophthalmic Surg Lasers* 1996; 27(5): 405–406.

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Sir,

Dyskinetopsia during light adaptation associated with nefazodone treatment

Eye (2003) **17,** 1040–1042. doi:10.1038/sj.eye.6700551

Dyskinetopsia is a rare selective defect of motion perception, which results in moving objects being perceived as leaving behind in their trail after-images. We report a case of dyskinetopsia during light adaptation associated with nefazodone and cimetidine treatment.

Case report

A 36-year-old man was commenced on 400 mg daily of nefazodone therapy for anxiety and depression in April 1999. After 12 months, the dosage was increased to 600 mg daily. After 2 weeks, he began experiencing

bizarre visual disturbances noticed only when he moved from a dark environment to a light environment. When he then fixated on a moving object, he saw a 'comet-like' trail of short-lived images persist behind the moving object. After a variable period of about 20–30 min in photopic conditions, the phenomenon spontaneously resolved. The same visual disturbances were perceived each time and only when he went from scotopic to photopic conditions, and continued for 4 weeks. He was very reluctant to reduce his nefazodone dose because of a favourable therapeutic effect. At 1 month prior to the onset of the symptoms, he had been prescribed 400 mg twice-daily oral cimetidine for gastritis, which he was still taking regularly. The cimetidine was discontinued after seeking medical advice. The dyskinetopsia subsequently resolved over the following week and has not since recurred. He continues to take 600 mg of nefazodone daily.

At the time of referral to us, he was visually asymptomatic. Visual acuity was 6/6 in both eyes. Ophthalmological examination was entirely normal.

Comment

Nefazodone is an antidepressant drug that blocks $5HT_2A$ receptors and is structurally similar to trazodone. Dyskinetopsia is a rare defect of motion perception, where moving objects are perceived leaving behind a series of 'freeze frame' images resembling the effect experienced with a strobe light. This is distinctly different from akinetopsia in which a patient loses the ability to perceive visual motion (motion imperception) and palinopsia, which manifests as image retention of stationary objects and is not specific for moving objects. In both phenomena, there seems to be a selective temporal defect of visual processing. We know of only four other reported cases of motion vision disturbance secondary to nefazodone therapy.[1–3] The use of the term akinetopsia in all of these cases may represent somewhat of a misnomer considering none of these patients had absent motion perception, but merely disturbed motion perception. Hence, we feel the term 'dyskinetopsia' describes the condition more accurately.

This case is unusual for two reasons: firstly, the symptoms were experienced only upon transition from scotopic to photopic conditions, and secondly, the symptoms resolved after withdrawal of cimetidine.

When our patient self-experimented, he found that the dyskinetopsia was only experienced after having been in dark conditions for an appreciable period of time of at least 10 min although this period was variable. Thus, it seems that he needed to be significantly dark-adapted in order to experience the symptoms of dyskinetopsia during light adaptation. The physiology of light adaptation occurs at the retinal level and so although the exact mechanism of dyskinetopsia remains elusive, this case would suggest that there is some interaction between the retinal components involved during motion detection and light adaptation. It is possible that the retina plays a role in the initial processing of motion perception, despite previous reports having provided support for intact and normally functioning retinal mechanisms in patients with disturbed motion perception.[4]

Previously, reports of true akinetopsia have all been of a single patient who experienced inability to perceive moving objects after a large bilateral CVA.[5] Damage sustained to the extrastriate cortical area V5 is thought to have resulted in the unusual visual phenomenon. Movson *et al*[6] demonstrated that it is the directionally selective cells of layer 4B of the primary visual cortex V1 that respond to motion. However, they[6] were unable to detect the global direction of motion of an object, which is the function of the visual association area V5. Experimental stimulation of area V5 in human subjects has demonstrated induction of symptoms of akinetopsia adding credence to the notion that area V5 is crucial to motion perception.[7]

Zeki has suggested that there are probably two component signals reaching V5 from the retina, the fast one taking 30 ms to reach V5 directly, and a slower one that travels to V1 and then on to V5. Attenuation of the fine balance of this temporally differential signalling system via a serotoninergic effect of nefazodone acting at the retinal level might provide us with a possible mechanism for the unusual visual disturbance of dyskinetopsia.

Horton *et al*[1] reported two cases of akinetopsia caused by nefazodone toxicity on daily doses of 200 and 400 mg. The symptoms in these cases resolved after complete withdrawal of therapy or in the reduction of the dose. In our case, the symptoms coincided with the increase in the dose of nefazodone from 400 to 600 mg daily, and resolved after withdrawal of the oral cimetidine therapy, without further alteration of the nefazodone dose. Nefazodone is metabolized by the cytochrome P_{450}III system. Cimetidine binds to microsomal P_{450} and hence inhibits oxidative hepatic metabolism. In the absence of serum levels of nefazodone, the coincidence of withdrawal of cimetidine therapy with the resolution of symptoms of dyskinetopsia provides strong circumstantial evidence that this interaction led to increased plasma levels of nefazodone and dyskinetopsia thus resulted from nefazodone toxicity. Currently, no specific interaction of cimetidine and nefazodone is listed in the British National Formulary, although there is mention of the inhibition of metabolism of some other

groups of CNS-acting drugs such as neuroleptics and antidepressants associated with cimetidine.[8,9]

This case supports the hypothesis that the symptoms of dyskinetopsia in a susceptible individual can be a dose-related phenomenon rather than an all-or-nothing side effect. Also highlighted is the importance of a detailed drug history when there is polypharmacy in order to identify any possible drug interactions. If complete withdrawal of nefazodone is not desirable in the light of a favourable therapeutic effect, withdrawal of potential inducing agents or a reduction in the dose of nefazodone may lead to resolution of the symptoms of dyskinetopsia.

References

1 Horton JC, Trobe JD. Akinetopsia from nefazodone toxicity. *Am J Ophthalmol* 1999; 128: 530–531.
2 Kraus RP. Visual trails with nefazodone treatment. *Am J Psychiatry* 1996; 153: 1365–1366.
3 Schwartz K. Nefazodone and visual side effects. *Am J Psychiatry* 1997; 154: 1038.
4 Zeki S. Cerebral akinetopsia (visual motion blindness). *Brain* 1991; 114: 811–824.
5 Movson JA, Adelson EH, Gizzi MS, Newsome WT. The analysis of moving visual patterns. *Exp Brain Res* 1985; 11: 117–151.
6 Beckers G, Zeki S. The consequences of inactivating areas V1 and V5 on visual motion perception. *Brain* 1995; 118 (Part 1): 49–60.
7 Zihl J, von Cramon D, Mai N. Selective disturbance of movement vision after bilateral brain damage. *Brain* 1983; 106: 313–340.
8 Joint Formulary Committee. *British National Formulary,* Vol 40. ed London: British Medical Association and Royal Pharmaceutical Society of Great Britain; 2000.
9 Joint Formulary Committee. *British National Formulary,* Vol 40. ed London: British Medical Association and Royal Pharmaceutical Society of Great Britain; 2000.

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