Resolution of Superior Oblique Myokymia with Memantine

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21 **Summary**

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23 We describe a novel treatment of superior oblique myokymia.. A forty year old woman

24 was treated with gabapentin for the above disorder with partial success and reported

25 significant side effects including loss of libido and weight gain. After a drug holiday,

26 memantine therapy was initiated, which caused a substantial improvement in her

27 symptoms with far fewer side effects, and stability on long-term maintenance therapy.

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Resolution of Superior Oblique Myokymia with Memantine

Superior oblique myokymia is an uncommon, monocular eye movement disorder involving contractions of the superior oblique muscle causing monocular oscillopsia and diplopia^{1,2} We describe a novel treatment for this disorder using memantine.

Case Report

A forty year old Caucasian woman presented with a two year history of intermittent episodes of paroxysms of right torsional oscillopsia with associated right eye pain. Her symptoms worsened with alcohol and were relieved by holding the right lid down. These symptoms lasted between five and ten seconds and recurred many times a day. Visual acuity was 6/6 in both eyes with no obvious strabismus or fourth nerve weakness. Episodes of fast pendular torsional movements of the right eye lasting approximately 5 seconds were detected on slit lamp examination .The rest of the ocular examination was unremarkable and an MRI was normal. Eye movements were recorded three dimensionally using a video–oculography technique (VOG) at a sampling rate of 50 Hz (Strabs system, Sensomotoric, GmbH, Teltow, Germany, for methods see reference 3). They showed a pendular torsional nystagmus (amplitude of approximately 2 degrees occurring at 1.4 Hz) without vertical component in the right eye, which coincided with the patient perceiving oscillopsia (Figure 1A).

Superior oblique myokymia was diagnosed and oral gabapentin with incremental doses of 300 mg at weekly intervals until a total daily dose of 2400 mg was prescribed. This

controlled the symptoms for twelve months (Figure 1B) but the patient reported side effects consisting of tiredness, weight gain and loss of libido. However, over the next three months she noticed a recurrence of sharp eye pains, double vision and headaches and we decided to change her medication.

The gabapentin was stopped for two weeks and the patient started on oral memantine at 5 mg daily increasing by 5 mg every three days to a maximum dose of 20 mg in two divided doses.

She reported a substantial improvement in her symptoms with the memantine, with far fewer headaches, no more diplopia and no systemic side effects. Eye movement recordings did not show any abnormal torsional movements with memantine (figure 1C).

The patient had been on the treatment for six months at time of this report and remained symptom free with no side effects.

Comment

Superior oblique myokymia is typically an idiopathic disorder with a variable clinical presentation. In some cases researchers have described an association with vascular compression of the trochlear nerve at the root exit zone, usually by a branch of the posterior cerebral or superior cerebellar artery. This vascular compression may not be detected on a routine MRI scan and therefore a specific protocol may be required.^{3,4} This association has also resulted in the technique of micro vascular decompression as a surgical treatment modality for superior oblique myokymia.^{3,4} Williams and colleagues recently emphasized the potential benefits of medical treatment for superior oblique myokymia in contrast to surgical options.⁵ Carbamazepine, the initial drug of choice,

76 had serious potential side effects including leucopenia , acute renal failure,
77 thromboembolism and arrhythmias and the blood counts, hepatic and renal function
78 needed to be monitored regularly. Therefore drugs with a more favorable safety profile
79 were evaluated and phenytoin, propranolol baclofen, and oral and topical beta blockers
80 have all been used with varying degrees of success^{2, 7} In addition to the drugs listed above
81 gabapentin has recently been reported as an effective drug for controlling superior
82 oblique myokymia⁸⁻¹⁰.

83 Gabapentin acts as a glutamate antagonist by inhibiting N-methyl D-aspartate (NMDA)
84 receptors⁹ or by influencing voltage sensitive sodium and calcium channels.¹¹ We
85 therefore decided to use memantine which is an NMDA receptor antagonist with similar
86 anti-glutaminergic action.¹²

87 We have found gabapentin and memantine to be effective in the treatment of congenital
88 and acquired nystagmus¹³. Both drugs lead to subjective improvement in oscillopsia and
89 reduction in amplitude of nystagmus in both groups. Interestingly, in patients with
90 multiple sclerosis, memantine has been reported to reduce nystagmus that was
91 unresponsive to gabapentin¹³. Its action in superior oblique myokymia could be similar
92 to the one in nystagmus.

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94 Although no definitive recommendations can be made based on this single case report, in
95 this case memantine was effective in controlling symptoms and was tolerated well by the
96 patient.

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146 Legend

147 Figure1: Torsional eye movement recordings of the right eye (RE) and left eye (LE) on
148 right gaze of the patient before treatment (A), with gabapentin treatment (B) and with
149 memantine treatment (C). As the recordings were taken outside of primary position the
150 recordings show a relatively high noise level.

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