Visual side-effects from transdermal scopolamine (hyoscine)

Case report

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Transdermal scopolamine may be used to reduce drooling in children with disabilities. Side-effects include dilated pupils and a reduction in the near point of accommodation (the closest point at which clear vision is possible). Two male children with epilepsy, one with spinal dysraphism (aged 7y 6mo) and one with cerebral palsy (aged 5y 8mo), who have undergone treatment for drooling with transdermal scopolamine are described. Near visual acuity was reduced, and both children showed dilated pupils with reduced or no response to light. These responses became normal on cessation of the scopolamine patch. As the effect of this drug may be cumulative, and many patients are unable to communicate difficulties, clinicians need to be aware of these possible side-effects.

The significant reduction of salivary flow by the administrtation of transdermal scopolamine has led to its use for drooling (sialorrhea). With repeated doses of the drug, visual problems, including a reduction in the near point of accommodation (the closest point at which clear vision is possible), have been reported in adults without disabilities (Parrott 1986). No mydriasis (dilation of the pupil) or other side-effects were observed by Siegel and Klingbeil (1991) in a 4-year-old child with severe spastic quadriplegia, developmental delay, and extremely limited cognitive function who used scopoderm over a 2-year period – a new patch being applied every 72 hours. However, when investigating short-term wear in children with developmental delay aged 5 to 18 years, two-thirds of the patients were noted to have pupillary dilation (Lewis et al. 1994).

We report two chidren who appeared to have near vision problems when using transdermal scopolamine (Scopoderm TTS) patches which dispense 1mg of the drug over a 72-hour period.

Child 1

A male aged 7 years 6 months with spinal dysraphism and epilepsy was seen during routine vision screening in his school. Generally, he had moderate delay and severe communication problems. His mother reported that the child was sensitive to light even when wearing a hat. Distance visual acuity was 6/6 in either eye, and near visual acuity was 6/15 (Lea symbols) with both eyes open. Pupils were both dilated and unreactive. Subjective response to accommodation testing was not possible due to reduced level of cooperation. No strabismus was present and there was no need for glasses (refractive error was right [R]:+0.50 and left [L]:+0.50/-0.50 at 180). However, sunglasses were advised. A full scopolamine patch was being worn, and sodium valproate (400mg) taken twice daily. After discussion with the paediatrician the patch was left off. Near visual acuity improved to 6/7.5 (Cardiff cards) with both eyes

open. Pupillary responses were normal. The teacher reported that the child's attention had improved.

Child 2

A male with cerebral palsy (CP), microcephaly, epilepsy, and global developmental delay had been under observation and was wearing glasses for long sightedness (R:+5.00/+1.00 at 90 and L:+5.00/+0.50 at 90). Pupils had been noted to react directly to light, but when seen at the age of 5 years 8 months pupils were dilated and not constricting fully to light. He was taking clobazam 2mg twice daily in liquid form and wearing a scopolamine patch. The patch had been increased from a quarter to a full patch by his mother because he was still drooling. Formal testing was limited because the child had severe learning difficulties and no means of communication. An intermittent convergent squint was queried and visual acuity tested at 0.5m (Cardiff cards) was 6/76 with both eyes open when the patch was being worn and 6/48 when he was seen without the patch.

Discussion

Both children showed reduced near vision at the time when the scopolamine patch was being worn. This would be a consistent finding if accommodation was reduced, however formal testing of this was not possible in either male due to lack of cooperation. The lack of cooperation could also affect the repeatability of the visual acuity tests. Child 1 performed a test which demanded cooperation and reduced near vision (tested at 33cm) was found in relation to distance vision (tested at 6m) while wearing the patch. As concentration is often easier to maintain when using near tests we feel this is reliable. In child 2, only a near objective test was possible and cooperation could have affected repeatability.

Dilated pupils may also lead to blurred vision, increased sensitivity to light, and other problems, such as increased flicker when viewing a computer screen. Brodtkorb et al. (1988) point out that the identification of side-effects is difficult in patients who have little or no speech. If a near vision problem is identified which is due to reduced accommodation, lenses may be prescribed for near work or a bifocal segment given if glasses are already worn. However, this necessitates the child looking through the correct part of the glasses and bifocal use can be difficult in a child with multiple disabilities.

Good and Crain (1996) report a case of a 4-year-old male with spastic quadriplegia prescribed one-quarter of a patch. After 5 days a 40 prism dioptre convergent strabismus (inward turning eye) developed, no significant hypermetropia (long sightedness) was present, and pupils were round and reactive to light. Seven days after cessation of the patch, the deviation had resolved. The authors suggest that the effect on accommodation led to the strabismus.

After a study on the short-term safety of use in children (aged 1–11y) where scopolamine has been used prophylactically as an anti-emetic after strabismus surgery, Horimoto et al. (1991) state that the size of the existing patches should be reduced for children. In their study a quarter patch was used for children under 2 years old, and one-half in older children. Serum levels of this drug may be increased following successive patch applications (Schmitt et al. 1981).

Accommodation has been shown to be reduced in patients with CP(Leat 1996) and this may be an additional factor in resultant near vision problems in these children. The side-effects of other medication may also affect the near response, but in our cases improvement was shown on cessation of the patch.

Alternative forms of treatment for drooling are available, including behavioural approaches. Other medications available are also antimuscarinic and so have potentially similar side-effects. Where medication is unsuccessful, or side-effects are severe, intraglandular botulinum toxin or surgery may be considered (Blasco 2002).

Clinicians need to be alert to the problems with near vision that may result from the use of scopolamine for drooling in children with disabilities.

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