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[Intervention Review]

Interventions for dissociated vertical deviation

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ABSTRACT

Background

The term "strabismus" describes misalignment of the eyes. One or both eyes may deviate inward, outward, upward, or downward. Dissociated vertical deviation (DVD) is a well-recognized type of upward drifting of one or both eyes, which can occur in children or adults. DVD often develops in the context of infantile- or childhood-onset horizontal strabismus, either esotropia (inward-turning) or exotropia (outward-turning). For some individuals, DVD remains controlled and can only be detected during clinical testing. For others, DVD becomes spontaneously "manifest" and the eye drifts up of its own accord. Spontaneously manifest DVD can be difficult to control and often causes psychosocial concerns. Traditionally, DVD has been thought to be asymptomatic, although some individuals have double vision. More recently it has been suggested that individuals with DVD may also suffer from eyestrain. Treatment for DVD may be sought either due to psychosocial concerns or because of these symptoms. The standard treatment for DVD is a surgical procedure; non-surgical treatments are offered less commonly. Although there are many studies evaluating different management options for the correction of DVD, a lack of clarity remains regarding which treatments are most effective.

Objectives

The objective of this review was to determine the effectiveness and safety of various surgical and non-surgical interventions in randomized controlled trials of participants with DVD.

Search methods

We searched CENTRAL (which contains the Cochrane Eyes and Vision Trials Register) (2015, Issue 8), Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid MEDLINE Daily, Ovid OLDMEDLINE (January 1946 to August 2015), EMBASE (January 1980 to August 2015), PubMed (1948 to August 2015), Latin American and Caribbean Health Sciences Literature Database (LILACS) (1982 to August 2015), the *meta*Register of Controlled Trials (*m*RCT) (www.controlled-trials.com) (last searched 3 February 2014), ClinicalTrials.gov (www.clinicaltrials.gov), and the WHO International Clinical Trials Registry Platform (ICTRP) (www.who.int/ictrp/search/en). We did not use any date or language restrictions in the electronic searches for trials. We last searched the electronic databases on 3 August 2015.

Selection criteria

We included randomized controlled trials (RCTs) of surgical and non-surgical interventions for the correction of DVD.

Data collection and analysis

We used standard procedures expected by Cochrane. Two review authors independently completed eligibility screening, data abstraction, 'Risk of bias' assessment, and grading of the evidence.

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Main results

We found four RCTs eligible for inclusion in this review (248 eyes of 151 participants between the ages of 6 months to 22 years). All trials were assessed as having unclear risk of bias overall due to insufficient reporting of study methods. One trial was conducted in Canada and compared anteriorization of the inferior oblique muscle with resection versus anteriorization of the inferior oblique muscle alone; one in the USA compared superior rectus recession with posterior fixation suture versus superior rectus recession alone; and two in the Czech Republic compared anteriorization of the inferior oblique muscle versus myectomy of the inferior oblique muscle.

Only one trial reported data that allowed analysis of the primary outcome for this review, the proportion of participants with treatment success. The difference between inferior oblique anteriorization plus resection versus inferior oblique anteriorization alone was uncertain when measured at least four months postoperatively (risk ratio 1.13, 95% confidence interval 0.60 to 2.11, 30 participants, very low-quality evidence). Three trials measured the magnitude of hyperdeviation, but did not provide sufficient data for analysis. All four trials reported a relatively low rate of adverse events; hypotropia, limited elevation, and need for repeat surgery were reported as adverse events associated with some of the surgical interventions. No trials reported any other secondary outcome specified for our review.

Authors' conclusions

The four trials included in this review assessed the effectiveness of five different surgical procedures for the treatment of DVD. Nevertheless, insufficient reporting of study methods and data led to methodological concerns that undermine the conclusions of all studies. There is a pressing need for carefully executed RCTs of treatment for DVD in order to improve the evidence for the optimal management of this condition.

PLAIN LANGUAGE SUMMARY

Treatment for eyes that drift upwards

Review question

The aim of this review was to evaluate the effectiveness of surgical and non-surgical treatments for dissociated vertical deviation.

Background

Eye misalignment (strabismus) is the drifting of one or both eyes, which can be inward, outward, upward, or downward. This review evaluated the treatment for a specific type of upward drifting of one or both eyes known as dissociated vertical deviation (DVD). DVD can occur in both children and adults. For some people, DVD is controlled and is only detectable during testing. In others, DVD happens all of a sudden as the eye drifts up of its accord. It can be hard for the person to gain control of the eye, which can cause distress to the person in social situations. The condition also may cause double vision or eyestrain.

Surgery is the common treatment for DVD. Treatments that do not involve surgery are uncommon. There is limited evidence about the effectiveness of treatments (either surgical or non-surgical) for DVD.

Study characteristics

We conducted the search for studies on 3 August 2015. We found four randomized controlled trials (RCTs) of surgical treatment for DVD. We found no studies evaluating non-surgical treatments. One trial was conducted in Canada and compared a surgical repositioning procedure (anteriorization of the inferior oblique muscle) with or without resection; one in the USA compared surgical weakening of an eye muscle (superior rectus recession) with or without augmentation with a fixation suture; and two in the Czech Republic compared anteriorization of the inferior oblique muscle versus removal of a piece of the inferior oblique muscle (myectomy).

Key results

Only one of the RCTs examined what we wanted to know: the proportion of participants who had surgical success. There was insufficient information available to determine the differences between any of the surgical procedures with respect to surgical success or any other outcome relevant to our review. The most common adverse events from the surgical procedures were downward drifting of the eye after surgery (hypotropia), limited upward movement of the eye, and need for repeat surgery.

Quality of the evidence

All four of the included studies had flaws in design, execution, or both that weaken their conclusions. There is a need for well-designed, rigorously conducted RCTs of treatments for DVD to provide more reliable evidence for the management of this condition.