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[Intervention Review]

Surgical interventions for primary congenital glaucoma

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ABSTRACT

Background

Primary congenital glaucoma (PCG) manifests within the first few years of a child's life and is not associated with any other systemic or ocular abnormalities. PCG results in considerable morbidity even in developed countries. Several surgical techniques for treating this condition, and lowering the intraocular pressure (IOP) associated with it, have been described.

Objectives

To compare the effectiveness and safety of different surgical techniques for PCG.

Search methods

We searched CENTRAL (which contains the Cochrane Eyes and Vision Group Trials Register) (*The Cochrane Library* 2014, Issue 6), Ovid MEDLINE, Ovid MEDLINE In-Process and Other Non-Indexed Citations, Ovid MEDLINE Daily, Ovid OLDMEDLINE (January 1946 to June 2014), EMBASE (January 1980 to June 2014), (January 1982 to June 2014), PubMed (January 1946 to June 2014), the *meta*Register of Controlled Trials (*m*RCT) (www.controlled-trials.com), ClinicalTrials.gov (www.clinicaltrials.gov), 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 23 June 2014.

Selection criteria

We included all randomized and quasi-randomized trials in which different types of surgical interventions were compared in children under five years of age with PCG.

Data collection and analysis

We used standard methodological procedures specified by The Cochrane Collaboration.

Main results

We included a total of six trials (four randomized and two quasi-randomized) with 102 eyes in 61 children. Two trials were conducted in the USA and one trial each in Egypt, Israel, Lebanon and Saudi Arabia. All trials included children aged younger than one year when diagnosed with PCG, and followed them for periods ranging from six months to five years.

No two trials compared the same pair of surgical interventions, so we did not perform any meta-analysis. One trial compared trabeculotomy versus goniotomy; a second trial compared combined trabeculectomy-trabeculotomy with mitomycin C versus trabeculectomy-trabeculotomy with mitomycin C and deep sclerectomy; a third trial compared combined trabeculotomy-trabeculectomy versus trabeculotomy; a fourth trial compared one goniotomy versus two goniotomies; a fifth trial compared trabeculotomy versus

viscocanalostomy; and the sixth trial compared surgical goniotomy versus neodymium-YAG laser goniotomy. For IOP change and surgical success (defined by IOP achieved), none of the trials reported a difference between pairs of surgical techniques. However, due to the limited sample sizes for all trials (average of 10 children per trial), the evidence as to whether a particular surgical technique is effective and which surgical technique is better still remains uncertain. Adverse events, such as choroidal detachment, shallow anterior chamber and hyphema, were reported from four trials. None of the trials reported quality of life or economic data.

These trials were neither designed nor reported well overall. Two trials were quasi-randomized trials and judged to have high risk of selection bias; four trials were at unclear or high risk for performance bias and detection bias; and we judged one trial to have high risk of attrition bias due to high proportions of losses to follow-up. Due to poor study design and reporting, the reliability and applicability of evidence remain unclear.

Authors' conclusions

No conclusions could be drawn from the trials included in this review due to paucity of data. More research is needed to determine which of the many surgeries performed for PCG are effective.

PLAIN LANGUAGE SUMMARY

Surgical interventions for childhood glaucoma

Review question
This review compared the effects of different surgeries for primary congenital glaucoma (PCG).

Background
PCG is a type of childhood glaucoma, usually beginning in the first five years of life. PCG is caused by an abnormal drainage system in the eye in the absence of other eye or health problems. Fluid naturally produced by the eye builds up causing high pressure within the eye. In children younger than five years, the high fluid pressure can cause the eye to enlarge (distend) leading to a cloudy cornea (clear front part of the eye), decreased vision, tearing, and light sensitivity. Failure to treat this condition may result in partial or total blindness.

PCG is primarily treated by surgery to reduce the pressure in the eye. Some surgeries aim to open up the drainage system of the eye either from the inside (goniotomy) or the outside (trabeculotomy, viscocanalostomy). Other surgeries involve making a new drainage pathway for the eye (trabeculectomy, deep sclerectomy, implantation of a device). Drugs, such as mitomycin C, also may be used during surgeries to prevent the drainage openings from closing up.

Study characteristics
We found six trials comparing different surgeries for PCG. These trials included 102 eyes of 61 children. Two trials were conducted in the USA and one trial in each of these four countries: Egypt, Israel, Lebanon and Saudi Arabia. All trials enrolled infants younger than one year when diagnosed with PCG, and followed them from six months to five years after surgery. No two trials compared the same pair of surgical interventions. One trial compared trabeculotomy versus goniotomy; the second trial compared combined trabeculectomy-trabeculotomy with mitomycin C (CTTM) versus trabeculectomy-trabeculotomy with mitomycin C with deep sclerectomy (CTTM-DS); the third trial compared combined trabeculotomy-trabeculectomy versus trabeculotomy; the fourth trial compared one goniotomy versus two goniotomies; the fifth trial compared trabeculotomy versus viscocanalostomy; and the sixth trial compared goniotomy using a blade versus a laser. The evidence is current to 23 June 2014.

Key results
In our review, no two trials compared the same pair of operations. Further, there were small numbers of children included in each trial (average of 10 children per trial), thus limiting our ability to draw conclusions about the effectiveness of one surgery over another. Four trials reported adverse events, but no trial reported an important difference between pairs of operations. None of the trials reported quality of life or economic data.

Quality of the evidence
The overall quality of the evidence on our review topic was poor. All trials had some limitations in study design, reporting, or both. None of the trials enrolled enough participants to detect an evident difference between surgeries.