INBRIEF | Summarizing the Evidence

Intraocular Lenses for Infants with Aphakia

Key Messages

- For infants with aphakia, there did not appear to be a benefit in clinical effectiveness with intraocular lens (IOL) implantation compared with conventional treatment (glasses or contact lenses).
- The overall incidence of adverse events between infants and children was similar, except for the number of additional surgeries. Infants who underwent IOL implantation required more re-operations due to more frequent complications, such as visual axis opacification.
- No cost-effectiveness data were identified.
- Overall, IOL implantation in patients 12 months or younger does not appear to confer significant visual or safety benefits compared with implantation later in life.

Context

Aphakia is a condition in which the eye does not have a lens — the flexible structure that enables light to focus on the retina. Congenital aphakia is rare, caused by a genetic defect. However, noncongenital aphakia is primarily caused by lens removal following surgical extraction of a cataract or trauma causing lens displacement. This systematic review focuses on noncongenital aphakia in patients 12 months or younger. Treatment options for visual correction of aphakia in this population include insertion of an artificial IOL into the eye to replace the natural lens, or the use of glasses or contact lenses (conventional treatment).

Technology

An IOL is a tiny, artificial lens made of silicone, acrylic, or other plastic that is permanently fixated in the eye. Some of the benefits of IOL implantation compared to conventional treatment may include eliminating the bulkiness of glasses for aphakia (which are typically very thick and heavy); avoiding the irritating sensations, infection risk, or hassle that can occur with contact lenses (and can lead to poor adherence); and potentially producing better visual outcomes. However, many questions and considerations remain. These include what the actual clinical effectiveness and safety of IOL implantation is compared to conventional treatments, as well as how this varies with the patient's age at the time of implantation (including how the safety, complication rate, and potential need to correct the IOL power may vary with age).

Issue

A review of the literature regarding the clinical effectiveness, safety, and cost-effectiveness of IOL implantation (both the mode of treatment — comparing it to contact lenses or glasses, as well as the age of treatment — comparing patients under 12 months to patients 1 to 12 years old) will help to inform decision-making in this space.

Methods

CADTH conducted a systematic review evaluating:

- The clinical effectiveness, safety, and cost-effectiveness of IOL implantation versus contact lenses or glasses in infants 12 months or younger.
- The clinical effectiveness, safety, and cost-effectiveness of IOL implantation in infants 12 months or younger compared to children 1 to 12 years old.

CADTH also engaged 2 family caregivers with lived experiences of caring for young children with aphakia to provide family perspectives.

Results

In total, 18 studies (3 randomized controlled trials and 15 nonrandomized studies) were identified that addressed the clinical questions of this review. Regarding clinical effectiveness, there did not appear to be a benefit to visual acuity with early IOL implantation compared with conventional treatment (glasses or contact lenses) for infants with aphakia. Regarding safety, the overall incidence of adverse events between infants and children was similar, except for the number of additional surgeries. Infants who underwent IOL implantation required more re-operations due to more frequent complications such as visual axis opacification.

CADTH

It is also important to consider costs and resource use, both to the health care system and to families. However, no cost-effectiveness studies were identified.

Families and caregivers reported stress related to the use of contact lenses as well as stress related to the outcomes of surgery and the effects on the child. They emphasized the importance of timely treatment to ensure the child's optimal development.

Overall, IOL implantation in patients 12 months or younger does not appear to confer significant visual or safety benefits compared with implantation later in life.

Read more about CADTH and its review of IOLs for infants with aphakia at www.cadth.ca/sites/default/files/pdf/htis/2022/RE0036%20Intraocular%20lens%20infants%20v.7.0-final.pdf.

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