On detection, treatment and prevention of complications in paediatric cataract surgery

Akademisk avhandling

som för avläggande av medicine doktorsexamen vid Sahlgrenska akademin, Göteborgs universitet kommer att offentligen försvaras i R-aulan, Hus R, Sahlgrenska Universitetssjukhuset/Mölndal, Länsmansgatan 28, Mölndal, fredagen den 6 december 2019, klockan 09:00

av
Alf Nyström

Fakultetsopponent: Professor Ian Christopher Lloyd, University College London/ Great Ormond Street Hospital for Children, London, Storbritannien

Avhandlingen baseras på följande delarbeten


SAHLGRENSKA AKADEMIN
INSTITUTIONEN FÖR NEUROVETENSKAP OCH FYSIOLOGI
On detection, treatment and prevention of complications in paediatric cataract surgery

Alf Nyström
Sektionen för klinisk neurovetenskap, Institutionen för neurovetenskap och fysiologi, Sahlgrenska akademin, Göteborgs universitet, Sverige.

Abstract

Purpose: To find and validate methods for diagnosis, treatment and prevention of complications in paediatric cataract surgery.

Background: Cataract and glaucoma are major treatable blinding conditions in children. Surgery for cataract in children and for its major complications, secondary glaucoma (SG) and visual axis opacification (VAO), are performed in general anaesthesia in the child. Knowledge on detection, indication and treatment as well as complication rates and risks are important to make the right decisions.

Methods: Data on diagnosis, treatment and outcome for children subjected to surgery was retrieved from medical records or from the Paediatric Cataract Registry (PECARE).

Results: Refractive change mapping is an effective method to follow development after early cataract surgery enabling detection of SG. Glaucoma treatment with chamber angle surgery and shunt draining device is safe and reduces pressure levels adequately. Visual acuity (VA) levels seems good. With primary implantation of bag-in-the-lens intraocular lens (BiL-IOL), the rate of VAO is low, 4.6%. Comorbidity is common and SG more frequent in eyes with early surgery for congenital cataract; Surgery in infants before 5 weeks of age has a high SG rate but results in higher corrected distance visual acuity levels compared to surgery between 5 and 12 weeks of age. Performing surgery between 5 weeks and 2 years of age resulted in a SG rate of 6.7% with primary implantation of a BiL-IOL. In a Swedish registry cohort of paediatric cataract surgeries <8 years of age and a mean follow-up of 3.31 years, the incidence of surgically treated SG was 23.7%. The majority was early-onset (< 1 year after surgery). With 58.3% infants (surgery within 3 months of age) this rate is fair. The incidence of late-onset glaucoma was low but the time span too short for prediction.

Conclusion: Early detection and treatment of congenital cataract and SG are important for good VA results during childhood. Chamber angle surgery and shunt draining device lower pressure adequately in cases of SG. With primary implantation of a BiL-IOL the VAO rate was 4.6% in children from 2 weeks to 16 years of age. High rates of SG are obtained when performing surgery during the first 5 weeks. Postponing surgery to after 5 weeks of age seems to reduce the rate of early-onset secondary glaucoma. The low SG incidence for surgery after 5 weeks of age indicates safety from a glaucoma perspective for implantation of BiL-IOL in children over 5 weeks of age.

Keywords: paediatric cataract, paediatric glaucoma, primary intraocular lens, visual axis opacification.