

Short Report

Pediatric ophthalmic indications for examination under anesthesia in Ilorin, Nigeria

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Abstract

Objective: To determine the ophthalmic indications and challenges for pediatric ocular examination under anesthesia (EUA).

Methods: The surgical register and patients' records of children who underwent EUA between 1990 and 2007 were examined to document patients' bio data, diagnoses and details of procedures and anesthesia.

Results: Thirty-nine children underwent EUA during the 18-year period. The indications included congenital glaucoma (20 cases, 21.3%) and congenital cataract (5 cases, 12.8%). There were two cases each (5.1%) of microphthalmia, megalocornea, and squint. A case each of other indications constituted the remaining 10.3%.

Conclusion: The commonest ophthalmic indication for EUA among children is congenital glaucoma. Most of the children (36, 92.3%) had inhalational anesthesia administered by anesthetists at great cost to their parents. We recommend the use of ketamine anesthesia administered by nonanesthetist with some training in anesthetic resuscitation procedure, for short pediatric procedure such as EUA in resource-challenged settings.

Keywords: Congenital eye diseases, examination under anesthesia, pediatric anesthetics

Résumé

Objectif: Pour déterminer les indications ophtalmologiques et de défis pour examen oculaire pédiatrique sous anesthésie (UCE).

Méthodes: Le registre chirurgical et les dossiers des enfants qui ont subi des UCE entre 1990 et 2007 ont été examinés aux patients de documenter les données bio, les diagnostics et les détails de procédures et d'anesthésie.

Résultats: Trente-neuf enfants ont subi UCE pendant la période de 18 ans. Les indications incluent un glaucome congénital (20, 21.3%) et la cataracte congénitale (5, 12.8%). Il y a eu 2 cas chacun (5.1%) de microphthalmia, megalocornea et strabisme. Un cas d'autres indications constituait la 10.3% restants.

Conclusion: L'indication ophtalmologique la plus courante pour UCE chez les enfants est un glaucome congénital. La plupart des enfants (36, 92.3%) avaient l'anesthésie inhalationnelle administrée par les anesthésistes à grands frais à leurs parents. Nous recommandons l'utilisation de l'anesthésie ketamine administrée par un anesthésiste non formé en procédure d'anesthésie-réanimation, pour la procédure pédiatrique courte comme UCE dans les paramètres de ressources contestées.

Mots-clés: Anesthésie pédiatrique, examen sous anesthésie, maladies de l'oeil congénitale

Introduction

Examination under anesthesia (EUA) often has to be resorted to for ophthalmic patients who are unable to tolerate a complete examination within

the outpatient clinic setting. Pediatric patients, owing to their tender ages and attendant lack of cooperation, form the bulk of such patients. They therefore have to be examined under short period of general anesthesia in the operating theatre.

Ocular morbidities and blindness in children constitute serious public health challenges^[1,2] for a number of reasons. Firstly, though the prevalence of blindness is lower in children than in adults,^[3] children have a greater burden of blindness due to their much higher disability adjusted life years (DALY).^[4] Secondly, treatable causes of blindness in children, if left uncorrected, may leave them permanently blind. Lastly, a blind child poses great challenges to education and emotional development.^[5]

Efforts to prevent childhood blindness cut across the disciplines of ophthalmology, pediatrics, public health, agriculture, water supply and sanitation. But, whatever the cause of the ocular morbidity in a child, a complete ocular examination sometimes under anesthesia is crucial to eliciting accurate diagnosis. The dearth of anesthetists in a developing country such as Nigeria, the fact that both the anesthetist and the ophthalmologist are operating in the same localized anatomic area (the face), and the possibility of direct interruption of ocular physiology all pose some anesthetic challenge. It is in this light that we seek to examine the ophthalmic indications for EUA as well some of the challenges posed.

Materials and Methods

This study was carried out in line with the guidelines of ethical review committee of University of Ilorin Teaching Hospital (UIH), Ilorin, Nigeria. The study is a retrospective review of children who underwent EUA over a period of 18 years (1990–2007). The EUA took place at the operating theatre of the UIH.

The case records of all paediatric patients (<16 years) who either underwent EUA alone or as a prerequisite for undergoing further definitive surgery were included in the study. Children whose EUAs were merely initial steps into their definitive surgical intervention (e.g. lid repair surgery) were excluded from the study.

Data captured from the hospital case folders and theatre registers included patients' bio-data, indication for EUA, type of anesthesia offered and cost implication. Data were collated, entered and analyzed using SPSS version 12 statistical software. Simple proportion analysis was employed.

Results

A total of 39 children whose age and sex distribution is as illustrated in Table 1 had examination under anesthesia (EUA) between 1990 and 2007. About half of the children (18, 46.2%) were infants (<1

year old), while boys predominated (M:F = 2.3:1).

Congenital glaucoma was the indication for EUA in 20 (51.3%) of the children. Table 2 gives a breakdown of all the indications for EUA in the study population. Thirty-nine children (92.3%) had inhalational anesthesia involving the administration of halothane, oxygen and nitrous oxide through an endo-tracheal tube. Two-thirds of the patients (26, 66.6%) had EUA alone while the remaining third (13, 33.4%) had additional definitive surgical procedure immediately following EUA, as illustrated in Table 3.

Discussion

The proportion of children needing examination

Table 1: Age and sex distribution among the children

Age (years)	Male	Female	Total (%)
<1	16	2	18 (46.2)
1–3	7	8	15 (38.4)
4–6	3	1	4 (10.3)
>7	1	1	2 (5.1)
Total	27	12	39 (100.0)

Table 2: Indications for EUA

Diagnosis	Number of children (%)
Congenital glaucoma	20 (51.3)
Congenital cataract	5 (12.8)
Microphthalmia	2 (5.1)
Ocular albinism	1 (2.6)
Congenital maculopathy	1 (2.6)
Optic atrophy	1 (2.6)
Amaurosis	1 (2.6)
Megalocornea	2 (5.1)
Exotropia	2 (5.1)
Blindness ? cause	1 (2.6)
Blindness ? cause in SCD patient	1 (2.6)
Congenital ectropion	1 (2.6)
Cortical blindness	1 (2.6)
Total	39 (100)

SCD: Sickle cell disease

Table 3: Type of anesthesia administered on the children and the procedure carried out

	Number of children (%)
Anesthesia	
Sedation using paraldehyde or ketamine	3 (7.7)
Inhalational anesthesia	36 (92.3)
Total	39 (100)
Procedure	
EUA + measurement	26 (66.6)
EUA + measurement + surgical procedure	13 (33.4)
Total	39 (100)

under anesthesia (EUA decreased with increasing age as only six of the 39 children (15.4%) were aged 4 years and above. Older children are likely to understand spoken instructions and co-operate better with some of the diagnostic procedure without sedation/anesthesia. The predominance of boys in our study may be influenced by the fact that the incidence of congenital glaucoma which constituted over half of the indications is higher among boys than girls.^[6]

The need to analyze the pattern of usage of anesthesia in a developing country such as Nigeria is informed by the dearth of anesthetic personnel (about one anesthetist to 1 million population), equipment and consumables. EUA featured prominently in the list of surgical procedures in other tertiary health establishments in Nigeria,^[7,8] but the aforementioned constraints had compelled some ophthalmic surgeons to use intravenous ketamine for pediatric ophthalmic surgery.^[9] The use of oral chloral hydrate sedation as a substitute for EUA in pediatric ophthalmology as advocated by Judisch *et al*^[10] way back in 1980 produces poor sedation for short periods and is hence not commonly in use for the much more complex modern EUA procedures.

The average cost in our hospital emanating from general anesthesia alone, excluding ophthalmic costs, is about \$50 USD. This is a princely sum in a country in which over 70% spend less than \$1 USD in a day.^[11] In order to overcome these shortcomings, we recommend that health practitioners in a country such as Nigeria further explore the use of ketamine anesthesia for pediatric ophthalmic surgery. Even in settings where cost consideration is not a major constraint, ketamine when used alone^[12] or as the induction anesthetic agent,^[13] has a distinctive advantage in not falsely lowering intraocular pressures as most other anesthetic agents do. The study of Pun *et al*^[14] in which they found the use of ketamine anesthesia in a consecutive series of 679 Nepalese children to be safe and effective needs to be further explored as a nonanesthetist with some training in resuscitative procedure administered the drug.

In conclusion, the commonest ophthalmic indication for EUA among children is congenital glaucoma. Most of the children had inhalational anesthesia administered by anesthetist at great cost to parents. We advocate an increasing use of ketamine

anesthesia administered by a nonanesthetist with some training in anesthetic resuscitation procedure, for short pediatric procedure such as EUA in a resource-challenged environment like Nigeria.

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