Uniocular blindness among children in The Gambia

R.E. Duke and H.B. Faal

Ophthalmology Unit, Royal Victoria Hospital, The Gambia.

Correspondence to: Dr. Roseline E Duke, Department of Ophthalmology, University of Calabar Teaching Hospital, P.O.Box 910, Calabar, Cross River State, Nigeria.

(E-mail: roselineduke@yahoo.co.uk)

Abstract

Background: Uniocular blindness in children though not uncommon has not been given prominence, as emphasis is placed on binocular blindness.

Aim: To determine the common causes of uniocular blindness in children, and to suggest strategies for prevention.

Methods: A prospective study involving children seen at the Eye Clinic of the Royal Victoria Hospital, The Gambia was undertaken; from the 1st December 1999 to 30th June 2000. All newly diagnosed cases of children who attended the clinic and were blind in one eye during the period of the study were included. A history was taken, visual acuity using age specific methods and ocular examinations were carried out. When necessary an examination under anaesthesia was performed.

Results: Out of 470 children, 45(10%) had uniocular blindness, 39(86%) were aged 6-15 years. The male - female ratio was 4:1. Common causes were trauma 28(62%), uveitis 4(9%), and corneal ulcer 3(7%). Others included congenital cataract, glaucoma and retinoblastoma.

Conclusion: The commonest cause of uniocular blindness was ocular trauma. Focus should be directed towards the prevention, early referral and appropriate treatment of ocular trauma in children. Strategies for the prevention of childhood blindness would also be applicable to uniocular blindness in The Gambia.

Key words: Children, Uniocular blindness, Gambia

Introduction

Uniocular blindness prevents binocular vision and good aesthetics in children. Binocular concordant information provides better exteroception of form and colour and better appreciation of the dynamic relationship of the body to the environment, thereby facilitating control of manipulation, reaching and balance. Furthermore, visual field overlap and stereopsis are achieved with binocular vision alone. When vision becomes uniocular these advantages are lost. Yet uniocular blindness has not received due emphasis in developing countries.

In The Gambia, no study has been conducted on the causes of uniocular blindness in children. This study was therefore conducted to provide this information and to suggest strategies towards prevention of the problem.

Patients and Methods

This study was conducted in the Eye unit of the Royal Victoria Hospital, The Gambia, between 1st December 1999 and 30th June 2000. The Royal Victoria Hospital (RVH) Eye unit is the only tertiary eye centre in The Gambia. The study was approved by the Ethical Committee of the hospital.

The inclusion criteria for the study were children with uniocular blindness between the ages of 0-15 years, who presented, or were referred, to RVH during the period of the study. History was taken from the carers and those with corneal opacities had further questioning to determine the possible cause.

Functional visual acuity assessment on children less than 5 years was carried out by an ophthalmologist to determine whether the child had useful vision. Useful vision was defined as an
appropriate response to at least two of the following: response to a smiling face, menace reflex, light fixation, and following or reaching for a red bead measuring 0.2 cm in diameter.

Distance visual assessment was performed on children aged 5 years and above by an ophthalmic nurse, using the local picture chart. The categories of visual loss used were those of the World Health Organization.

Pinhole testing was performed on children aged 5 years and above with visual acuity <6/18. Anterior segment examination was performed on children aged 5 years and above where possible by the same ophthalmologist, using a pen torch as well as the slit lamp biomicroscope.

Direct and indirect ophthalmoscopy was used to assess the posterior segment after dilating the eye with guttae Mydriacyl 1%. Examination under anaesthesia using ketamine was performed especially in posterior segment diseases to confirm a diagnosis.

The anatomic cause and possible aetiology of visual loss was determined for each eye. Children requiring ocular surgical, medical or optical treatment were attended to by the ophthalmologist.

Statistical analysis was performed on a data spreadsheet using a scientific calculator.

Results

The total number of children seen during the period was 470. Forty-five (10%) children had uniocular blindness. The common causes of uniocular blindness were trauma, corneal scars and uveitis. Trauma was singularly responsible for 28 cases (62%) which represented the commonest cause of uniocular blindness seen in these children, followed by corneal scars from ulcers and harmful traditional eye medication and uveitis, each accounting for 4 (9%) cases. Other causes included optic atrophy, congenital cataract and glaucoma, microphthalmos and retinoblastoma. Furthermore the male to female ratio was 4:1 (Table 1). Thirty nine cases (86%) were between the ages 6-15 years (Table 2).

### Table 1. Causes of uniocular blindness in children presenting at the Royal Victoria Hospital, The Gambia

<table>
<thead>
<tr>
<th>Condition</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma</td>
<td>2</td>
<td>26</td>
<td>28</td>
<td>62</td>
</tr>
<tr>
<td>Corneal scar from ulcer</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>HTEM</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Uveitis</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Optic atrophy</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Congenital cataract</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Congenital glaucoma</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Microphthalmos</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Retinoblastoma</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9</strong></td>
<td><strong>36</strong></td>
<td><strong>45</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

HTEM = Harmful traditional eye medication

### Table 2. Age distribution of uniocular blindness among children presenting at RVH

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Number</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1-5</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>6-10</td>
<td>33</td>
<td>73</td>
</tr>
<tr>
<td>11-15</td>
<td>6</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Discussion

The hospital incidence of uniocular blindness in children from this study in The Gambia, 10%, is high. Eye Injury which is preventable was found to be the commonest cause of uniocular blindness in this study. This is a known cause of uniocular blindness in developing countries. However, it has not been documented as the leading cause of uniocular blindness in children in developing countries. Furthermore, information is lacking, probably because emphasis is placed on prevention of binocular blindness. Contrarily, in a similar study done in Ireland prenatal causes including congenital malformations, were the leading causes of uniocular blindness. This difference may be a reflection of differences in socioeconomy, awareness and
adoption of the preventive measures on ocular trauma. Penetrating trauma if not appropriately managed may cause sympathetic ophthalmitis, a rare bilateral panuveitis which may eventually lead to binocular blindness. Other complications following trauma include phthisis bulbi, staphyloma, corneal scarring and an anophthalmic socket following surgery for severe ocular injuries. Uniocular injuries are reported to be very disabling and are more severe in African adults but the effect on children has not been investigated. The resultant disfigurement from a traumatized eye, especially for females, may have a major physical and psychological impact on the child.

Ocular trauma was responsible for 5.3% of cases of bilateral blindness in children in the under 5 age group in a hospital based study in Malawi. This does not appear to be the case in The Gambia, where it is responsible for uniocular blindness. In Nigeria, it is a major cause of uniocular blindness however, among the general population.

In view of the advantages of binocular vision and the largely undetermined effects of uniocular blindness in relation to vision in the other eye and the development of the child, the prevention of uniocular blindness from trauma in The Gambian children, may also have significant benefits for the preservation of binocular vision along with the attendant advantages.

Ocular trauma occurred mostly in the males. The male to female ratio was 4:1. This has been noted in other studies. Males are more adventurous and their behavior more risky.

In this study, the age group most affected was the 6-10 years age group and the commonest cause was trauma. This is the primary school age group. Activities for the prevention of blindness from ocular injuries should be targeted at primary prevention and primary level activities. These would involve the parents and carers, the children themselves, the primary schools and education authorities. Better public health education, legislative measures for eye health safety and safety precautions in schools and homes in The Gambia would need to be advocated. Counselling on the use of protective spectacles should be encouraged to prevent injury to the second eye.

The second commonest cause of uniocular blindness was corneal scarring from infectious ulcers and HTEM which is also a preventable condition. This is an important cause of childhood blindness in The Gambia. Consequently, the prevention of corneal blindness through multisectorial collaboration with nutritionists, traditional medical practitioners/healers, educators, community leaders, legislators, primary healthcare workers, eye care workers and ophthalmologists would help to reduce uniocular blindness caused by corneal ulceration.

Uveitis accounted for 9% of cases. The etiology was not investigated. Investigations into the etiology of uveitis in children in The Gambia need to be carried out. Other causes of uniocular blindness in children included congenital cataract and glaucoma as well as retinoblastoma. These conditions are treatable. The incidence of uniocular blindness from congenital cataract and glaucoma could be reduced or eliminated if early identification and early appropriate treatment is instituted. Retinoblastoma cannot be prevented but early identification with appropriate treatment may give a better visual prognosis, and reduce uniocular blindness as well as mortality.

The duration of the study was short. This is a limitation of the study.

In conclusion, the commonest cause of uniocular blindness in children in The Gambia is ocular trauma. Focus should be directed towards the prevention, early referral and appropriate treatment of ocular trauma in children. The suggested strategies for the prevention of childhood blindness would also be applicable to uniocular blindness in The Gambia. Furthermore, studies are required to look into uniocular blindness as a risk factor for morbidity and blindness in the other eye. Lastly, the impact of uniocular blindness on the quality of life and development of the child urgently needs investigating.

Acknowledgment

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References


10 WHO/PBL/00.77. Preventing blindness in children, Hyderabad, India, 13-17 April 1999; 7-8.