Nigerian Journal of Paediatrics 2002; **29(2)**:47-52

Pattern of Paediatric Ophthalmic Admissions into the Ogun State University Teaching Hospital, Sagamu

OO Onabolu*

Summary

Onabolu OO. Pattern of Paediatric Ophthalmic Admissions into the Ogun State University Teaching Hospital, Sagamu. *Nigerian Journal of Paediatrics* **2002; 29:47.** Visual impairment in childhood is an impediment to learning and social development. A study of paediatric ophthalmic admissions into the Ogun State University Teaching Hospital, Sagamu, was conducted to establish the main causes of admission, and the visual outcome after treatment. Of the 89 eyes in 67 patients whose case notes were analysed, infection (38 per cent), trauma (30 per cent), congenital diseases (17 per cent) and tumours (15 per cent) were the four main groups of ocular diseases seen. Measles infection was the major blinding disease. Trauma was associated with the worst visual prognosis in spite of treatment. Congenital cataract was the commonest congenital ocular disease. Although the visual outcome after cataract surgery was fair, the development of amblyopia prevented maximal visual recovery. The possibility of rubella aetiology of the cataract could not be ruled out in these patients. There is a need for sustained commitment to immunization. The availability of ophthalmic microsurgical instruments will improve the surgical care of patients with a view to better visual outcome.

Introduction

CAUSES of childhood blindness vary from country to country. Recent reports from schools for the blind in East Africa revealed that corneal pathology attributable to vitamin A deficiency and measles infection was responsible for proportionally more blindness and severe visual impairment in Malawi than in Uganda and Kenya.[1] Another report from India indicated that the incidence of corneal blindness due to vitamin A deficiency varies from state to state and is related to the level of industrialization and urbanization.[2,3] Comparing causes of blindness in West Africa, South India and Chile, Gilbert *et al* found that avoidable conditions accounted for 70 per cent of blindness in West Africa, 47 per cent in South India and 56 per cent in Chile.[4] While corneal scar and phthysis bulbi were the commonest causes of blindness in West Africa, in Chile it was retinal diseases. A study from a paediatric ophthalmology clinic in Ireland revealed that prenatal and mostly unavoidable causes accounted for 47.9 per cent of 71 patients.[5]

Olabisi Onabanjo University Teaching Hospital, Sagamu

Department of Ophthalmology

* Senior Lecturer

In Nigeria, literature reports by various workers in the last three decades,[6-9] have revealed that corneal pathology resulting from measles infection and vitamin A deficiency is the commonest cause of childhood blindness. Probably in response to these avoidable causes of blindness, the Federal government intensified childhood immunization under the Expanded Programme on Immunization (EPI) and more recently National Programme on Immunization. Measles immunization was included in the campaign. In Ogun State, vitamin A supplementation was given to primary school children. The positive effects of these programmes on the status of the cornea with respect to childhood blindness should be reflected in hospital admissions in children. Hospital based studies can provide useful information on the changing (if any) causes of childhood blindness. Such studies can also indicate the visual outcome after treatment of children afflicted with ocular diseases. A retrospective study of paediatric ophthalmological admissions into the Ogun State University Teaching Hospital was carried out in order to establish the causes of ocular morbidity in children and the visual outcome after treatment.

Patients and Methods

A retrospective study of paediatric ocular morbidity necessitating admission was carried out at Ogun State University Teaching Hospital (OSUTH), Sagamu. This is

University Teaching Hospital (OSUTH), Sagamu. This is a tertiary institution, which draws its patients mainly from Ogun state (population of about 3.5 million), and occasionally from neighbouring states. The study period covered January 1988 to December 1997. The patients were seen by a consultant ophthalmologist (OO, alone up till 1996 and joined by another ophthalmology resident doctors after this). All records of ophthalmic patients aged 15 years and below admitted into the children's ward from January 1988 to December 1997 were retrieved and the following data were recorded: the age and sex of the patient, immunization status, visual acuity on admission and on discharge, diagnosis and treatment. Visual acuity was measured with Snellens chart according to the WHO criteria.[10] Vision in preverbal children was not recorded. Blindness was recorded as visual acuity less than 3/60 or counting fingers at six metres. The eyes were examined with pen torch, slit lamp biomicroscope, direct and indirect ophthalmoscope as indicated. Some of the patients were examined under anaesthesia; these were patients with intraocular tumours and those with congenital ocular diseases. Special investigations like computerized tomography and X-rays were done on some cases in whom malignancies were suspected.

Results

Two thousand and fifty children with ophthalmic complaints were seen over the specified 10-year period in the eye clinic. One hundred and twenty four children were admitted. A total of 6317 children were admitted for all diseases during the study period; therefore approximately two per cent were admitted for eye related diseases. Of the 124 children admitted, complete records could be obtained in only sixty-seven cases. The records in respect of eighty-nine eyes in these sixty-seven patients were analysed. The vision in 29 eyes of 17 patients could not be checked because they were preverbal children. Pretreatment visual acuities were determined in 60 eyes belonging to 50 patients while forty-eight eyes in 41 patients were available for post treatment visual acuities. This was because six patients with nine involved eyes discharged themselves against medical advice while three patients in whom three eyes were involved, died. The duration of illness before presentation was between three and seven days with a mean of five days. Nine patients with eye tumours presented between one and eight months with a mean of six months. The ages of the children comprising 44 males and 23 females, ranged from one month to 15 years with a mean of five years. Table I shows the diagnostic pattern of ocular diseases in the 67 patients. Table II reveals the pre and post-treatment visual acuity in some of the patients. Fifty-eight of the 89 eyes analysed had avoidable diseases. Table III shows the visual analysis of these 58 eyes out of which 24 became blind after treatment.

Analysis of the diagnostic categories

Infection

Infection was the commonest diagnosis occurring in 38 per cent of the patients (Table I). Preseptal cellulitis was the commonest type of infection occurring in 14 eyes. *Staphylococcus aureus* was isolated from the blood in the two patients that developed cavernous sinus thrombosis. The blood culture in the others did not grow any organisms while the conjunctival specimen grew *Staphylococcus aureus.*

Table I

Diagnostic Categories in 89 Eyes of 67 Patients

Diagnosis	*No of Eyes*	*Percentage of Total*
Infections	34	38
Trauma	27	30
Congenital	15	17
Tumours	13	15
Total	89	100

Table II

Pre and Post Treatment Visual Acuity in 60 Eyes

Visual Acuity	*Pre-treatment*	*Post-treatment*
HM – NPL	44(73.3)	28(58.3)
CF – 6/60	6(10)	2(4.2)
6/18 – 6/36	5(8.3)	7(14.6)
6/9 –6/12	3(5)	5(10.4)
>6/9	2(3.4)	6(12.5)
Total	60(100)	48(100)

Figures in parentheses represent percentages of total

HM = Hand movement
NPL = No perception of light
CF = Counting fingers

Note: Six patients with involvement of nine eyes were discharged against medical advice. Three patients with 3 eyes involved, died

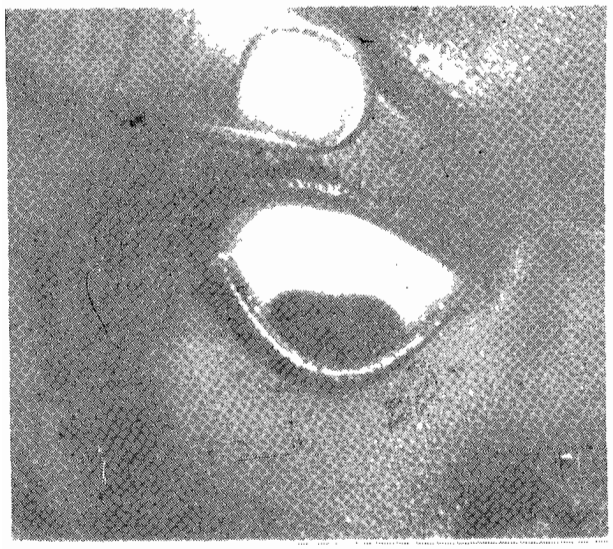

Fig.1. Draining bleb after 11 years post trabeculectomy in buphthalmos.

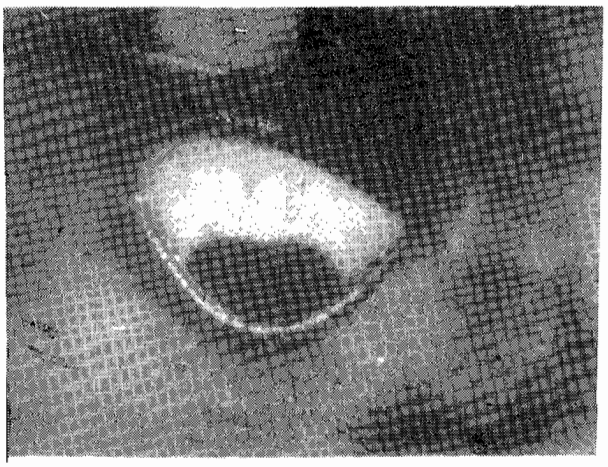

Fig. 2. Draining bleb 10 years after trabeculectomy.

Table III

Post Treatment Visual Acuity in Avoidable Ocular Diseases

Diagnosis	*Number of Eyes*	*Visual Acuity*		
		≥6/18	*6/24-6/60*	*<3/60*
Blunt trauma with hyphaema	8	5	0	3
Penetrating intra-ocular injury	14	2	5	7
Blunt trauma with cataract	3	0	1	2* Aphakic
Trauma to adnexae	2	2	0	0
Pre-septal cellulitis	14	12	0	2
Post-measles keratopathy	7	1	1	5
Corneal ulceration	6	5	0	1
Pan-ulceration	4	0	0	4
Total	58	27	7	24

Visual acuity: 3/60 - <3/60 = Blind
6/24 - 6/60 = Moderate visual impairment
≥6/18 = No visual impairment

After blood had been withdrawn for culture, the patients with cellulitis were usually commenced on antibiotics empirically. Post measles keratopathy affected seven eyes in five patients. Four of the patients were not immunized against measles; two of the children had used traditional medication on the eyes. Treatment consisted of vitamin A capsules on two consecutive days, the dose depending on the age of the patient; 100,000 units for children under one year and 200,000 units for children above one year. The eyes were treated with subconjunctival injection of gentamicin after swab specimens of the ulcers were taken for microscopy, culture, and sensitivities. Three of the corneas that perforated were treated surgically with conjunctival flaps. Panophthalmitis occurred in four eyes which were eviscerated since neither topical nor systemic antibiotics could control the suppuration. One patient had bilateral dacryocystitis resulting from non-canalisation of nasolacrimal ducts. He was treated with topical and systemic antibiotics. Six eyes were treated for suppurative keratitis (corneal ulceration); *Staphylococcus aureus* was the commonest organism cultured followed by *Pseudomonas aeruginosa*. The ulcers were treated according to sensitivity report. Atropine eye drops were also used twice daily for one week only. Four eyes regained their vision to 6/6.

Trauma

Twenty-seven eyes in 27 patients sustained injuries. Eight eyes in eight patients had traumatic hyphaema (blood in the anterior chamber) following blunt trauma; these were managed either medically or were surgically drained. Four eyes each were surgically drained and medically treated with oral acetazolamide. The choice of treatment depended on the level of blood in the anterior chamber and secondary complication of glaucoma. After treatment, five eyes (62.5 per cent) had vision of 6/9 or better. Fourteen eyes in 14 patients had penetrating ocular trauma; they were all repaired surgically. Of these, only one patient had a vision of 6/9 after treatment. Seven patients had visual acuity less than 3/60, while six patients had visual acuity between 6/12 and 6/36. Traumatic cataract from blunt trauma occurred in three patients. They all had cataract extractions without intraocular lesion.

Congenital diseases

The patients with uniocular cataracts were not prescribed eye glasses because of gross anisometropia; the twins and another patient were also deaf, which raised the possibility of rubella aetiology of the cataracts. Trabeculectomy was performed on six eyes in three patients with congenital glaucoma (Fig. 1), which tended to be bilateral. The visual result was poor in those that presented late despite good draining blebs. One child operated upon at three months, had bilateral good visual acuity ten years after (Fig. 2). The two eyes in one child were treated for squints by muscle surgery. Vision was corrected with glasses pre-operatively for hypermetropia; the cosmetic and visual results were acceptable.

Tumours

Among children with oculo-orbital tumours, six patients had retinoblastoma (nine eyes), one patient had neuroblastoma (one eye), one patient had Burkitt's lymphoma (one eye) while one patient had bilateral pseudotumour of the orbits. Three patients with retinoblastoma had bilateral tumours, while three had uniocular tumours. The children who were all below three years presented with fungating tumours (three), classical leukocoria (two) and hyphaema (one). All the tumours were eventually confirmed histologically. Treatment in five patients entailed exenteration followed by chemotherapy and when available, radiotherapy; the sixth child defaulted. The survival rate was poor, with only one child surviving for four years after diagnosis while four children died within one year of presentation. The child with neuroblastoma (clinically diagnosed) also had a right sided abdominal mass. He died before treatment could be commenced. The child with Burkitt's lymphoma (one eye) also had a jaw tumour. The tumour regressed on chemotheraphy but he was lost to follow up. The child with pseudotumours of the orbits was diagnosed using computerized tomography and ultrasound. He had a good remission on prednisolone 30mg daily but the reactivation of the disease occurred intermittently for two years during attempts to tail off the steroids. He is still being followed up.

Discussion

The total number of patients admitted in ten years does not reflect the total number of paediatric ophthalmic patients seen over the period. Some of the patients that could have been admitted were treated on outpatient basis because the parents could not afford the mandatory deposit before admission. The poor financial status also contributed largely to the late presentation in many cases. Patients with infection and trauma that should have been treated effectively if they presented earlier came late with poor visual result. Infection was the commonest cause for admission and preseptal cellulitis was the most frequent diagnosis. Children were admitted more frequently for this cause because it was not possible to predict those that would progress to cavernous sinus thrombosis.[11] Indeed, two patients developed this serious complication, resulting in bilateral blindness. Panophthalmitis which is a sequela of neglected suppurative keratitis resulted in evisceration of four eyes, an avoidable sequela if only they had presented earlier. That post-measles keratopathy is the commonest cause of childhood blindness was further confirmed in this report. Contributing factors were lack of immunization in 70 per cent of the children, and application of traditional eye medication.[12] Immunization rate in Ogun State had dropped from 90 per cent in 1990 to 30 per cent in 1997.[13] Reasons for the poor compliance with respect to immunization may be attributed to worsening socio-economic conditions in the state with

parents having to go and seek the means of earning a living rather than spend hours at immunization clinics. Parental ignorance and poor maintenance of the cold chain in vaccine storage by health officials are also contributing factors. Some parents complained that their older children had measles despite immunization. Parents require continuous health education while health officials should be more committed in the maintenance of the cold chain. It was more difficult to treat traumatic cases than infected cases. The severity of injury invariably led to uniocular blindness confirming previous reports.[14,15] Trauma is avoidable if children were taught safety rules, and early presentation would prevent secondary infection. The operating microscope and viscoelastic substances might prove more effective in the repair of these eyes.

Unavoidable causes for admission occurred in 32 per cent of the patients. These were mainly congenital diseases, of which congenital cataract was the commonest. The presence of cardiac murmurs and congenital deafness in some of the patients raised the possibility of rubella syndrome. There is a need for a multi-centre study on congenital cataracts to evaluate the current status of this condition and proffer possible preventive measures. Perhaps the result will provide an indication for routine immunization for girls against rubella. Spectacle correction for aphakia is usually difficult to maintain in these children, and they invariably become amblyopic.

Trabeculectomy for bilateral buphthalmos was effective in maintaining normal vision in only one child that presented at three months of age. The usual experience with congenital glaucoma is that patients present late when treatment in any form can only reduce ocular discomfort.[16] Admission for squints was very low; a further evidence of the infrequent presentation of strabismus in our hospitals.[17] Parents of children with squints tended to ignore the abnormality.

Oculo-orbital tumours especially retinoblastoma constituted 15 per cent of the admissions. All the patients with neoplastic growths presented late. It was usual for them to have been seen elsewhere before finally presenting for surgery at OSUTH, supporting previous reports.[18] Despite radical surgery, chemotherapy and radiotherapy, the survival rate was very poor. Parents are usually reluctant to have their children's eyes removed for any reason. Perhaps the medical team requires the co-operation of the social services department to articulate this decision properly. Another problem of early treatment is that of diagnosis. Vitreous tap via the pars plana for malignant cells is probably the most reliable in developing countries. A setback for diagnostic investigations in our experience is the high cost of general anaesthesia and histology which most of our patients could hardly afford. Nevertheless, it is pertinent to make a laboratory diagnosis before enucleation or exenteration.

The prevalence of childhood blindness in Africa has been estimated to be 1.1 per 1000.[19] Seventy per cent of this estimate is avoidable. Avoidable blindness are those due to preventable causes like measles and treatable causes like infections and trauma. In this review, 68 per cent of the patients were admitted for avoidable causes. There is a need for primary eye care workers in the state to initiate the treatment of ocular infections and to refer trauma cases when necessary. There is also an urgent need for a sustained commitment to immunization. The introduction of ophthalmic microsurgery in hospitals will improve the surgical care of patients. It would thus seem that the causes of childhood blindness in Nigerian children have not changed over the last 30 years. This will be better demonstrated by a community survey rather than a hospital study, but our findings would suggest that more emphasis should be placed on preventive measures like immunization, primary health care services in the rural areas and better supervision of children at play.

References

1. Gilbert CE, Wood M, Waddell K, Forster A. Causes of childhood blindness in East Africa: results in 491 pupils attending 17 schools for the blind in Malawi, Kenya and Uganda. *Ophthalmology* 1995; **2**: 77-84.
2. Rahi JS, Sripathis S, Gilbert CE, Forster A. Childhood blindness due to vitamin A deficiency in India: regional variation. *Arch Dis Child* 1995; **72** : 330-3.
3. Rahi JS, Sripathis S, Gilber CE, Foster A. Childhood blindness in India: causes in 1318 blind school students in nine states. *Eye* 1995; **9**: 545-50.
4. Gilbert CE, Canovas R, Hagan M, Rao S, Forster A. Causes of childhood blindness: results from West Africa, South India and Chile. *Eye* 1993; **7**: 111-4.
5. Mulvihill A, Bowel R, Laugan B, Okefe M. Uniocular childhood blindness: a prospective study. *J Paediatr Ophthalmol Strabismus* 1997; **34**: 111-4.
6. Rodger FC. In: Blindness in West Africa. London: Levin Landine KL, 1959: 96-100.
7. Olurin O. Etiology of blindness in Nigerian children. *Amer J Ophthalmol* 1970; **70**: 533-40.
8. Magullike NC, Ezepue UF. Corneal diseases and childhood blindness: retrospective study. *Nig J Ophthalmol* 1993; **2**: 75-79.
9. Sandford-Smith J, White HC. Corneal ulceration following measles in Nigerian children. *Br J Ophthalmol* 1997; **63**: 720-4.
10. Vaughan D, Asbury T. Examination. In: General Ophthalmology. California: Lange Medical Pub, 1980: 16.
11. Osuntokun O. Orbital and periorbital cellulitis in Nigerians: A retrospective study of 35 patients. *Nig Med J* 1982; **12**: 259-63.
12. Forster A, Sommer A. Childhood blindness from corneal ulceration: causes, prevention and treatment. *WHO Bull* 1986; **64**: 619-23.
13. Personal communication. Ministry of Health, Local Govt Sagamu, Ogun State, 1998.
14. Onabolu OO. Visual loss in ocular trauma. *Nig J Ophthalmol* 1994; **2**: 18-24.
15. Onwasigwe EN, Umeh RE, Onwasigwe CN. Ocular injury

in children. *Nig J Ophthalmol* 1994; **2**: 9-12.
16.Waddel KM. Childhood blindness and low vision in Uganda. *Eye* 1998; **12**:184-92.
17.Baiyeroju-Agbeja AM, Owoeye JFA. Strabismus in children in Ibadan. *Nig J Ophthalmol* 1998; **6**: 31-3.
18.Adejor GO. Retinoblatoma as seen at National Eye Centre, Kaduna – a four year retrospective study from June 1993 – June 1997. *Nig J Ophthalmol* 1998; **6**: 9-15.
19.Gilber CE. Epidemiology of childhood blindness. Report on the fourth meeting of the consultative group of non-Governmental Organizations to the WHO programme for the prevention of blindness. WHO/PBL92.26: 10-13