Childhood blindness in Jamaica

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SUMMARY Examinations were performed on the 108 blind Jamaican children (VA < 6/60 in the better eye) in residential care. The congenital rubella syndrome (CRS) was the leading preventable cause of childhood blindness, accounting for 22% of children examined. Improvement of the rubella immunisation programme and the introduction of appropriate surgical procedures constitute recent attempts to combat childhood blindness.

The causes of childhood blindness in the tropics vary according to climate, nutrition, customs, control of infection, and economic development. The present study describes the causes of blindness in Jamaican children aged 5-15 years and identifies appropriate measures to combat the problem.

Materials and methods

The children examined resided at the Salvation Army School for the Blind in Kingston, where all Jamaican children aged 5-15 years known to have severe visual disability are referred. Unlike many blind schools, this school cares for all 'blind' children, many of whom also suffer from deafness and mental and physical disability. The clinical history and paediatric examination of all children is obtained prior to admission.

All children had an ophthalmic examination in March 1986 by portable slit-lamp microscopy and ophthalmoscopy. Further examination, testing of intraocular pressures, and photography were performed at the Medical Research Council Laboratories and the ophthalmology clinic at the University Hospital of the West Indies. Parents and siblings residing in other parts of the island were traced, whenever possible, to assist in documentation. Further ancillary tests, such as electroretinography, are not available in Jamaica.

Blindness was defined as having visual acuity of less than 6/60 in the better eye despite refractive correction. All the blind children were born in Jamaica and had resided there since birth.

Where possible the causes of blindness were divided into hereditary, prenatal (non-hereditary), perinatal, and postnatal. Hereditary causes were presumptively based on family history, inheritance, and the absence of clinical findings suggestive of prenatal, perinatal, or postnatal disorders.

Results

One hundred and eight blind children (49 males, 59 females) were examined. The commonest causes of blindness (Table 1) were congenital cataract (39%), optic nerve atrophy (18%), and glaucoma (15%). Blindness from the congenital rubella syndrome (CRS) accounted for 24 (22%) of the children and was identified as the leading preventable factor in Jamaica. Blindness in CRS was attributable to

Table 1 Causes of blindness in 108 Jamaican children aged 5-15 years

Causes	Cases n (%)	Mechanism
Cataract	= 42 (39)	20 Rubella; 14 hereditary; 8 ? cause
Optic nerve atrophy	= 19 (18)	6 Hereditary; 5 hydrocephalus; 2 Meningitis; 2 colobomata; 2 trauma; 1 Down's, 1 craniostenosis
Glaucoma	= 16 (15)	10 ? Cause; 4 rubella; 2 aniridia
Retina	= 9 (8)	7 Retinitis pigmentosa; 2 retinoblastoma
Myopia	= 7 (6)	5 Hereditary; 2 spontaneous
Uveitis	= 5 (5)	4 Toxoplasmosis; 1 sarcoid
Cornea	= 5 (5)	3 Dystrophy; 2 interstitial keratitis
Maculopathy	= 2 (2)	2 Hypoplasia
Nanophthalmos	= 1 (1)	
Marfan's syndrome	= 1 (1)	
Peters' anomaly	= 1 (1)	
Total	108	

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Table 2 Causes of childhood blindness in Jamaica and the UK by hereditary and acquired factors

		Jamaica	United Kingdom*
Hereditary	=42	(48%)	(50%)
Acquired			
1. Prenatal	=36	(41%)	(6%)
2. Perinatal	= 0	(0%)	(33%)
3. Postnatal	=10	(11%)	(11%)
Total	88		

*Data taken from Fraser and Friedman.¹

cataract in 20 cases (8 cases with microphthalmos) and glaucoma in four cases.

In 88 children it was possible to classify causes into hereditary and acquired (pre-, peri-, and postnatal), but in 20 children this division could not be applied with complete confidence (10 with glaucoma, six cataract, two retinoblastoma, two myopia). Comparison of these causes with those identified in the UK (Table 2) indicates an absence of perinatal factors.

Discussion

The causes of blindness in the 108 Jamaican children invite comparison with similar studies in the tropics—Saudi Arabia (187 cases),² Cyprus (112 cases),³ Lebanon (231 cases),⁴ and Nigeria (140 cases).⁵

The Jamaican picture is characterised by a high prevalence of blindness from CRS, unlike Cyprus, Lebanon, Saudi Arabia, and Nigeria, where rubella is thought to be contracted at a pre-childbearing age. Jamaica, like the UK, is 'modern' in that girls may encounter the virus later in life. However, the Jamaican approach to prevention of CRS is by selective vaccination of girls at 10 or 11 years, with many parishes achieving only 60–70% uptake in the target group.⁶ An epidemic of rubella is predicted in Jamaica between 1987 and 1990,⁶ and a committee of paediatricians, community health workers and ophthalmologists is promoting public awareness of the vaccine. Vaccination of Jamaican children against diphtheria, pertussis, tetanus, and measles is relatively complete, since failure may delay entry to primary school. Plans to use a combined measles and rubella vaccine at age 1–5 years will reduce disease frequency and generate a population or herd immunity effect.⁶

Cataracts were responsible for blindness in 39% of the children, with CRS the commonest cause. Four children were still resident in the blind school after operation and normal funduscopy, indicating the poor prognosis for delayed operations and deprivation amblyopia. A further two children were found to require dissection of an opacified posterior capsule.

Congenital and infantile glaucoma requires earlier detection and surgical intervention than is currently practised. Thermal sclerostomy and goniotomy will hopefully yield favourable results.

Malnutrition and postnatal infection appear to cause little corneal blindness in Jamaica, unlike Saudi Arabia and Nigeria, where keratitis from trachoma and measles prevail. However, the recent economic climate of Jamaica has been characterised by increasing poverty, unemployment, and rising food prices. Hospitalisation for malnutrition and vitamin A deficiency is increasing, and cases of xerophthalmia are reappearing for the first time in over 10 years. Corneal transplantation has not been readily available in Jamaica owing to the absence of necessary instruments and eye-banking facilities. However, recently donated equipment has allowed successful corneal transplantation in three of these children since March 1986. An eye bank is now being established to serve the community.

Hereditary disease accounted for 48% of childhood blindness in Jamaica, similar to the 50% observed in the UK¹ but less than the 77% in Lebanon⁴ and 79% in Cyprus.³ There is little consanguinity in marriage, but the endogamous population in villages may result in autosomal recessive disease. Also it is not uncommon for a Jamaican man to father children from several women; thus it is difficult to establish precise lines of heredity. Some of the 20 cases omitted from classification in Table 2 may in fact be hereditary.

The absence of perinatal causes of blindness (Table 2) contrasts markedly with their occurrence in the UK. This may be attributable to the inadequate facilities and lack of staff trained in ventilation of neonates with respiratory distress syndrome. In the UK these neonates requiring ventilation may survive, though subsequently manifesting retinopathy of prematurity on occasions. This complication will no doubt become manifest with improvement of the facilities for ventilation.

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References

- 1 Fraser GR, Friedman AI. *The causes of blindness in childhood. A study of 766 children with severe visual handicaps*. Baltimore: Johns Hopkins Press, 1967: 1–245.
- 2 Tabbara KF, Badr IA. The changing pattern of childhood blindness in Saudi Arabia. *Br J Ophthalmol* 1985; **69**: 312–5.

- 3 Merin S, Lapithis AG, Horovitz D, *et al.* Childhood blindness in Cyprus. *Am J Ophthalmol* 1972; **74**: 538–42.
- 4 Baghdassarian SA, Tabbaro KF. Childhood blindness in Lebanon. *Am J Ophthalmol* 1975; **79**: 827–30.
- 5 Olurin O. Etiology of blindness in Nigerian children. *Am J Ophthalmol* 1970; **70**: 463–76.
- 6 Baxter DN. Control of the congenital rubella syndrome in Jamaica. *West Indian Med J* 1986; **35**: 50–4.

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