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Legal Blindness among 10-Year-Old Children in Metropolitan Atlanta: Prevalence, 1985 to 1987

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ABSTRACT

The prevalence of legal blindness in 10-year-olds in metropolitan Atlanta was 6.8 per 10 000 during 1985 to 1987. The prevalence was 8.8 per 10 000 in Black boys, 8.6 per 10 000 in White boys, 6.7 per 10 000 in White girls, and 1.8 per 10 000 in Black girls. Retinopathy of prematurity was the most common known cause (1.0 per 10 000). Of the 61 cases, 40 had other disabilities, including 14 with mental retardation, cerebral palsy, and epilepsy. The low prevalence among Black girls and the frequent occurrence of blindness with other disabilities are noteworthy. (*Am J Public Health.* 1992;82:1377–1379)

Introduction

There is a lack of current data on the prevalence of childhood blindness in the United States. This paper examines three aspects of childhood blindness in Atlanta during 1985 to 1987: its prevalence, causes, and association with other developmental disabilities.

Materials and Methods

The Metropolitan Atlanta Developmental Disabilities Study estimated the prevalence of five developmental disabilities in 10-year-olds living in five metropolitan Atlanta counties during 1985 to 1987.[1]

Blind children were identified by reviewing records at public schools, hospitals, health and mental health service agencies, and public and private social service agencies. Blindness was defined as a best corrected visual acuity of 20/200 or worse in the better eye[2] or a statement by a trained person (i.e., ophthalmologist or optometrist) that the child was blind, since measuring visual acuity in young children, especially those with other disabilities, is often difficult. Age at documentation is defined as the earliest age at which records available to us stated that the child was blind or had a best corrected visual acuity of 20/200 or worse.

Etiology was defined as the underlying condition that led to blindness. Etiology was considered to be unknown if an underlying condition could not be determined from the available records even if the child was at high risk for blindness (e.g., due to prematurity). Age at onset was defined as the age at the time of the presumed etiologic event.

Prevalence rates and their 95% confidence intervals (CI) are reported per 10 000 10-year-olds.[3] Using data provided by the Georgia Office of Planning and Budget, we estimated that 89 534 ten-year-olds lived in Atlanta during 1985 to 1987. Race was defined as White or Black since all cases were either White or Black and 96% of children in Atlanta who are not White are Black.

Results

We identified 61 blind children (6.8 per 10 000) (Table 1). The prevalence of blindness was slightly higher in Whites than in Blacks but was higher in boys than in girls. However, the magnitude of the gender difference varied substantially by race.

Retinopathy of prematurity was the most common known cause of blindness (1.0 per 10 000; 95% CI = 0.5, 1.9) (Table 2). Thirteen children had an eye malformation. Two other children had cataracts resulting from prenatal infections. Thus, one quarter (15) of the cases were known

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TABLE 1—Prevalence of Legal Blindness among 10-Year-Old Children (per 10 000) by Race and Sex, Metropolitan Atlanta, 1985 to 1987

	White			Black			Total		
Sex	n	Rate	95% CI	n	Rate	95% CI	n	Rate	95% CI
Male	25	8.6	5.6, 12.7	15	8.8	4.9, 14.5	40	8.7	6.2, 11.8
Female	18	6.7	4.0, 10.5	3	1.8	0.4, 5.3	21	4.9	3.0, 7.5
Total	43	7.7	5.5, 10.3	18	5.4	3.2, 8.5	61	6.8	5.2, 8.8

TABLE 2—Etiology of Blindness among 61 Legally Blind 10-Year-Old Children, Metropolitan Atlanta, 1985 to 1987

	No.	%[a]
Congenital eye malformations	13	21.3
Genetic or hereditary condition	4	6.6
Albinism	1	1.6
Retinitis pigmentosa	1	1.6
Tuberous sclerosis[b]	1	1.6
Stargardt's syndrome	1	1.6
Infection	5	8.2
Prenatal	2	3.3
Postnatal	3	4.9
Retinopathy of prematurity	9	14.2
Other		
Anoxia/hypoxia	2	3.3
Central nervous system defect	4	6.6
Cerebrovascular accident	1	1.6
Head trauma	4	6.6
High myopia	1	1.6
Hydrocephaly	1	1.6
Hypoglycemia[c]	1	1.6
Neoplasm	2	3.3
Optic nerve atrophy	3	4.9
Radiation[d]	1	1.6
Stevens-Johnson syndrome[e]	1	1.6
Mixed etiology[f]	1	1.6
Missing[g]	8	13.1

[a]Does not add to 100% because of rounding.
[b]Tuberous sclerosis caused hydrocephaly and optic atrophy.
[c]Hypoglycemia of unknown etiology caused coma with subsequent cortical blindness.
[d]Radiation optic neuropathy was secondary to treatment for nasopharyngeal rhabdomyosarcoma.
[e]Stevens-Johnson syndrome caused corneal scarring.
[f]Blindness due to congenital glaucoma in one eye and myopia in the other.
[g]No information available on the etiology of blindness.

to have an eye malformation. Information on etiology was missing for eight cases.

Two thirds (39) of the cases had the condition that blinded them by the time they were 1 month old, but few were documented to be blind in infancy (Table 3).

Two thirds of the cases had at least one of four other disabilities; 40% (25) had at least two (Table 4). Fourteen (23%) children had mental retardation, cerebral palsy, and epilepsy (1.6 per 10 000; 95% CI = 0.9, 2.6).

Discussion

The prevalence of blindness in 10-year-olds in Atlanta is slightly higher than previously reported rates for developed countries (3.4 to 6.2 per 10 000).[4–8] Variations in the reported rates may be due to instability of rates based on small numbers or may represent real differences in occurrence, especially if survival of high-risk infants differs. Differences in ascertainment methods may also create apparent differences in prevalence rates. Cases may be underascertained if identified solely through schools for the blind or through blindness registries since these programs are usually voluntary.[4] Only 6 of 61 cases in this study had attended schools for the blind; 21 of the children with multiple disabilities had attended special education programs that were not designed specifically for blind children.

As in other studies, boys were more likely to be blind than girls.[5,6,8,9] However, six of the nine children with retinopathy of prematurity were girls. This finding could be due to small numbers, better survival of low-birthweight girls than boys,[10] or gender-based differences in birthweight.[6]

The overall prevalence of blindness was slightly higher in Whites than in Blacks, but the pattern differed by gender. Reasons for this finding are not clear, and the rates are based on small numbers. Few previous studies have reported race-specific or race-and-sex-specific rates of childhood blindness. An early study found that the prevalence was 20% lower among Whites than among other races, but the rates were not presented by gender.[4]

The low prevalence of blindness among Black girls is striking and should be confirmed in other populations. Ascertainment could differ by race or socioeconomic status but should not vary by gender. Thus, we do not believe that we have undercounted cases among Black girls. The prevalence might be low in Black girls if they are less likely to have conditions that put them at risk of blindness or if those at high risk are less likely to survive than other children.

As in previous studies, about two thirds of our blind children had other disabilities.[7,9,11] Blindness, mental retardation, epilepsy, and cerebral palsy occurred with an unexpectedly high frequency in this population. The occurrence of this combination of disabilities should be examined in other populations.

In earlier studies, 7% to 14% of blind children were hearing impaired, with most cases attributed to rubella.[8,9,11] In contrast, only three (5%) of our cases were hearing impaired; one case was attributed to congenital rubella syndrome. Thus, rubella appears to be a less important cause of blindness among children born in the mid-1970s than in previous birth cohorts.[12]

Our results underscore the concern that improved survival of low-birthweight infants may increase the prevalence of

TABLE 3—Age at Onset of Etiology and Age at Earliest Documentation of Blindness for 61 Legally Blind 10-Year-Old Children, Metropolitan Atlanta, 1985 to 1987

	Age at Onset, No. (%)	Age at Documentation, No. (%)
Age known	53 ...	61 ...
<1 month	39 (63.9)	1 (1.6)
1–11 months	6 (9.8)	8 (13.1)
1–4 years	4 (6.6)	21 (34.4)
5–10 years	4 (6.6)	31 (50.8)
Age unknown	8[a] (13.1)	0 ...

[a]One of these children was known to be blind by 10 months of age.

TABLE 4—Number of Legally Blind 10-Year-Old Children with Selected Other Disabilities, Metropolitan Atlanta, 1985 to 1987

Other Disabilities	No.	%
None	21	34.4
Mental retardation	9	14.8
Epilepsy	3	4.9
Cerebral palsy	2	3.3
Hearing impairment	1	1.6
Mental retardation and epilepsy	4	6.6
Mental retardation and cerebral palsy	3	4.9
Mental retardation and hearing impairment	2	3.3
Epilepsy and cerebral palsy	2	3.3
Epilepsy and hearing impairment	0	...
Cerebral palsy and hearing impairment	0	...
Mental retardation, epilepsy, and cerebral palsy	14	23.0
Mental retardation, cerebral palsy, and hearing impairment	0	...
Mental retardation, epilepsy, and hearing impairment	0	...
Epilepsy, cerebral palsy, and hearing impairment	0	...
Mental retardation, epilepsy, cerebral palsy, and hearing impairment	0	...

blindness due to retinopathy of prematurity since this condition accounted for 15% of our cases.[13–17]

Most of the conditions that caused blindness originated prenatally, and one quarter of the blind children had a congenital eye defect. These proportions might have been higher if our data on etiology had been more complete. However, most cases of blindness were first documented after age 4. The lag between age at onset and documentation may be related to our methodology or difficulties in measuring vision in very young children, and does not necessarily indicate a delay in treatment of childhood visual impairments. These findings emphasize the importance of early intervention and of identifying ways to improve the visual outcome of children born with conditions that put them at risk of being blind. □

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