ARTICLE

Descriptive Epidemiology of Infantile Cataracts in Metropolitan Atlanta, Ga, 1968-1998

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Background: Infantile cataract is an important cause of childhood visual impairment. Surgery before 6 weeks of age is recommended for optimal visual outcome. Description of the epidemiologic characteristics of cataracts is important for an improved understanding of the condition.

Objectives: To identify at-risk populations and facilitate successful treatment of patients with infantile cataracts.

Methods: Infants with cataracts diagnosed in the first year of life were identified using the Metropolitan Atlanta Congenital Defects Program, a birth defects surveillance program with active methods of case ascertainment, for the years 1968-1998. Several factors were analyzed, including year of birth, sex, race, maternal age, plurality (single vs multiple gestation), gestational age, birth weight, laterality, seasonality, and age at diagnosis.

Results: A total of 199 infants with cataracts were identified, for a rate of 2.03 per 10 000 births. In 117 infants (59%), cataracts occurred as an isolated defect; in 43 infants (22%), cataracts occurred as part of a syndrome; and in 39 infants (20%), additional, unrelated, major birth defects were also present. Rates were higher for low-birth-weight infants (those weighing <1500 g; risk ratio [RR], 6.01; 95% confidence interval [CI], 3.83-9.43) and preterm infants (RR, 1.70; 95% CI, 1.21-2.40). Of the cases that occurred as an isolated defect, 38% were diagnosed after 6 weeks.

Conclusions: This population-based study provides 31 years of data from a diverse US population and allows identification of risk factors for infantile cataracts. The finding that a number of infants with cataracts continue to have their conditions diagnosed after 6 weeks of age emphasizes the need for direct ophthalmoscopic examination of the red reflex in the newborn period to facilitate early detection and improve outcomes.

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CATARACT, an opacity of the crystalline lens of the eye, is one of the most common congenital eye malformations[1,2] and a significant cause of preventable childhood visual disability and blindness worldwide. Childhood blindness has been attributed to cataracts in as few as 4.7%[3] and as many as 39%[4] of children. In a study conducted during 1994-1997, 13.8% of the students attending the Alabama School of the Blind had visual impairment caused by cataracts.[5] Cataracts cause visual disability by degrading visual inputs to the immature central nervous system. Animal models have indicated that a critical period exists, after which early deficits within the visual system are irreversible.[6] Diagnosis and surgical treatment of cataracts must be completed in early infancy for optimal visual outcome. Although the ideal timing of surgical intervention has not been established, researchers have suggested that surgery before the age of 6 weeks is needed to optimize visual development in many forms of cataracts.[7-9]

In previous studies,[1,2,10-14] the prevalence of congenital cataracts has ranged from 0.6 to 6 per 10 000 births. In most cases, the cause of cataracts is unknown[15]; however, cataracts can result from many etiologic factors. When inherited, cataracts are usually transmitted as an autosomal dominant trait, often with variable expression.[16] Several genes associated with autosomal dominant cataracts have been identified.[16] Cataract is also a known feature of other single-gene conditions, chromosome abnormalities (including trisomy 21, 13, and 18 and Turner syndrome), and teratogenic exposures (eg, rubella, varicella, and cytomegalovirus).[17] In this study, we used a birth defects surveillance system with multiple sources of active case ascertainment to conduct a population-based study of infantile cataracts in metropolitan Atlanta, Ga, during

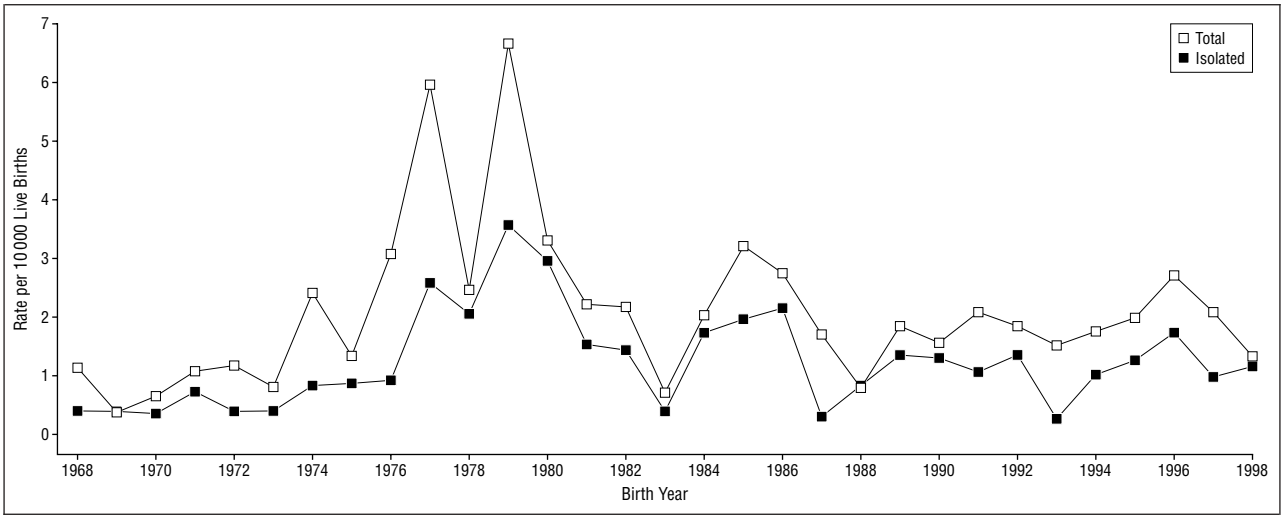

Figure 1. Rate (per 10 000 live births) of total and isolated cataracts by birth year, metropolitan Atlanta, Ga, 1968-1998.

1968-1998. We describe the epidemiologic characteristics and age at diagnosis of the defect to help identify at-risk populations and facilitate successful treatment.

METHODS

Case infants were identified using data from the Metropolitan Atlanta Congenital Defects Program (MACDP) for the years 1968-1998. MACDP has received approval by the institutional review board at the Centers for Disease Control and Prevention (protocol 1955). MACDP is a population-based birth defects surveillance program with ongoing case ascertainment from the approximately 40 000 births per year in the 5-county metropolitan Atlanta area. Case infants are live and stillborn infants of at least 20 weeks' gestation who have major structural defects. Pregnancy terminations of at least 20 weeks' gestation have also been included in recent years. For most of the years of this study, MACDP included infants with defects diagnosed or suspected only up to the first year of life.

MACDP uses active methods and multiple sources of case ascertainment.[18] Sources include birth and pediatric hospitals, a cytogenetics laboratory, a referral center that provides services to children with congenital heart defects, and vital records. Information on cases is abstracted from medical records (including progress notes, discharge summaries, laboratory reports, reports of radiographic studies, operative notes, and autopsy reports) by trained abstractors. Birth records are selected for review if a defect is noted in the hospital logs or disease indices (coded hospital discharge diagnoses) or if the infant meets certain criteria, including any surgery except circumcision.[19] Pediatric hospital records are selected for review if a birth defect is noted in the disease indices.[19] Defects are assigned a 6-digit code using a modification of the *International Classification of Diseases, Ninth Revision, Clinical Modification* and the British Paediatric Association coding systems.[19]

To ascertain cases of infantile cataract, we used the MACDP codes for cataract, not otherwise specified; cataract, anterior polar; and cataract, other specified (743.320-743.326, 743.328); and the codes for other specified and unspecified lens anomalies (743.380-743.384, 743.388, 743.390-743.394, 743.398). We limited our study to cases in which the diagnosis of cataracts was made or suspected within the first year of life. Individual case records were reviewed to confirm the presence of cataracts. Neither information on extent of lens opacification nor definitive data on whether surgery was performed were available for all years of the study; thus, this information could not be used as part of the inclusion criteria. To define more epidemiologically similar case groups,[20] cases were reviewed by a clinical geneticist and grouped into 3 categories used for other birth defects studies[21-23]: isolated (cataracts alone or with other minor or eye-related defects), multiple (cataracts with other major, unrelated defects), and those termed syndrome (cataracts presumed to be associated with a chromosome abnormality, single-gene condition, maternal history and pattern of defects consistent with teratogenic exposure, or a family history consistent with a mendelian mode of inheritance). Population data on resident births for the years 1968-1998 were obtained from the vital records of the Maternal and Child Health Division, Georgia Department of Human Resources. We analyzed rates of infantile cataracts by year of birth, sex, race, maternal age, birth weight, gestational age, and plurality (single vs multiple gestation). In addition, cases were analyzed for laterality and seasonality. Cases that occurred as an isolated defect were analyzed for age at diagnosis noted on the abstraction record. Since the variable "date of first diagnosis" on our abstraction record refers to when any congenital defect was diagnosed, use of this variable to determine age at diagnosis was not possible in cases in which diagnoses other than cataracts were included.

RESULTS

We identified 199 infants with cataracts among 982 128 infants born in the 5-county metropolitan Atlanta area during 1968-1998, yielding a rate of 2.03 per 10 000 births. Rates were calculated for total and isolated cataracts by year of birth for the period under investigation (**Figure 1**). The rates were relatively stable throughout the period, with the exception of 1977 and 1979, years during which rates increased.

Of the 199 case infants, 196 were liveborn, 2 were stillborn, and 1 was a pregnancy termination. Of these, 117 (59%) were classified as having isolated cataracts, for a rate of 1.19 per 10 000 births; all these infants were liveborn. Of the remaining infants, 39 (20%) were classified as having multiple birth defects and 43 (22%) as having cataracts as a feature of a syndrome. The syndrome category included 23 infants with chromosome abnormalities (most commonly trisomy 13), 12 with single-gene conditions (including 8 with presumed au-

tosomal dominant cataracts, all with at least 1 parent noted as having had congenital cataracts), and 8 whose cataracts likely resulted from a teratogen (eg, alcohol, rubella, and toxoplasmosis) (**Table 1**). Routine chromosome analyses had been performed on 39 infants (20%). Of the 38 case infants with multiple malformations, 12 had malformations of the central nervous system, 11 had limb or skeletal malformations, 10 had cardiac malformations, 10 had malformations of the genitourinary system, 3 had gastrointestinal malformations, and 3 had cleft lip and/or cleft palate.

Table 1. Syndromes Identified Among Cases of Infantile Cataracts, Metropolitan Atlanta, Ga, 1968-1998

Syndrome	No. of Cases
Chromosome abnormalities	
Trisomy 13*	11
Trisomy 21	6
Trisomy 18	2
del(3)(p25)	1
del(11)(p13p15.1)	1
inv(9)(q22.33q34.11) (Parents' karyotypes normal)	1
47,XX,+der(9)t(4;9)(q31.1;q21.2)	1
Single-gene conditions	
Presumed autosomal dominant†	8
Chondrodysplasia punctata	3
Galactosemia	1
Teratogen exposure	
Fetal alcohol syndrome	4
Congenital rubella syndrome	3
Toxoplasmosis	1

*Including one 13/14 translocation.
†Based on family history of at least 1 parent with congenital cataract.

Of the 199 infants with cataracts, 59 (30%) had other eye-related anomalies. A higher proportion of additional eye defects was found in those infants classified as multiples (13 cases or 33%) and syndromes (17 cases or 40%) when compared with isolated cases (29 cases or 25%). Overall, the most common additional eye findings were microphthalmia in 28 infants (14%) and persistent hyperplastic primary vitreous in 8 infants (4%).

The number of cases and rates of cataracts by sex, race, maternal age, birth weight, gestational age, and plurality were determined (**Table 2**). Risk ratios (RRs) and 95% confidence intervals (CIs) (Taylor series) were calculated using a statistical analysis package.[24] No difference was observed in the rate by sex for total or isolated cataracts. Nonwhite infants were more likely than white infants to have cataracts (RR, 1.31; 95% CI, 0.99-1.74), although this association was not statistically significant. A U-shaped distribution of risk was found for maternal age, with births occurring to women younger than 25 years (RR, 1.21; 95% CI, 0.90-1.62) and 35 years or older (RR, 1.56; 95% CI, 0.98-2.46) being more likely to result in an infant with cataracts compared with those of women 25 to 34 years old. This risk distribution also occurred in cases of isolated cataracts, although neither finding was statistically significant. Using 2500 to 3999 g as the referent category, infants weighing less than 1500 g were 6 times more likely to have cataracts overall (RR, 6.01; 95% CI, 3.83-9.43) and 3 times as likely to have isolated cataracts (RR, 3.11; 95% CI, 1.51-6.41). Cataracts were also significantly more likely in infants with birth weights of 1500 to 2499 g (RR, 2.53; 95% CI, 1.69-3.77). Preterm infants were more likely than full-term infants to have cataracts (RR, 1.70; 95% CI,

Table 2. Examination of Risk Factors for Total and Isolated Cataracts, Metropolitan Atlanta, Ga, 1968-1998

	Total			Isolated		
Variable	No. of Cases	Rate per 10 000 Births	RR (95% CI)	No. of Cases	Rate per 10 000 Births	RR (95% CI)
Sex						
Male	98	1.95	Referent	60	1.19	Referent
Female	99	2.06	1.06 (0.80-1.40)	57	1.19	1.00 (0.69-1.43)
Race						
White	108	1.81	Referent	67	1.12	Referent
Nonwhite	91	2.38	1.31 (0.99-1.74)	50	1.31	1.16 (0.81-1.68)
Maternal age, y						
<25	89	2.16	1.21 (0.90-1.62)	50	1.21	1.11 (0.76-1.64)
25-34	87	1.79	Referent	53	1.09	Referent
≥35	23	2.79	1.56 (0.98-2.46)	14	1.70	1.56 (0.86-2.81)
Birth weight, g						
<1500	22	10.31	6.01 (3.83-9.43)	8	3.75	3.11 (1.51-6.41)
1500-2499	29	4.34	2.53 (1.69-3.77)	6	0.90	0.75 (0.33-1.70)
2500-3999	134	1.72	Referent	94	1.20	Referent
≥4000	14	1.54	0.90 (0.52-1.56)	9	0.99	0.82 (0.42-1.63)
Gestational age, wk						
<37	42	3.93	1.70 (1.21-2.40)	17	1.59	1.09 (0.65-1.84)
37-41	143	2.31	Referent	90	1.46	Referent
≥42	10	0.98	0.43 (0.22-0.81)	7	0.69	0.47 (0.22-1.02)
Plurality						
Singleton	194	2.02	Referent	115	1.20	Referent
Twin	4	1.81	0.90 (0.33-2.41)	2	0.91	0.75 (0.19-3.05)
Other	1	13.59	6.72 (0.94-47.9)	0	0	. . .

Abbreviations: CI, confidence interval; RR, risk ratio.

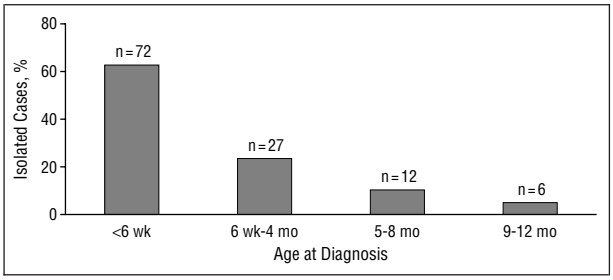

Figure 2. Infant age at diagnosis of isolated cataracts in metropolitan Atlanta, Ga, 1968-1998.

Table 3. Laterality of Cases of Infantile Cataracts by Case Classification (Isolated, Multiple, or Syndrome), Metropolitan Atlanta, Ga, 1968-1998

	No. (%) of Cases		
Category	**Bilateral**	**Unilateral**	**Unknown**
Isolated	29 (25)	73 (62)	15 (13)
Multiple	22 (56)	13 (33)	4 (10)
Syndrome	24 (56)	7 (16)	12 (28)
Total	**75** (38)	**93** (47)	**31** (16)

1.21-2.40). The association between prematurity and isolated cataracts was weak and not statistically significant. Since low birth weight and prematurity are highly correlated, we attempted to evaluate the relation between low birth weight and cataracts independent of gestational age by examining this relation among full-term infants (gestational age of 37-41 weeks). Among full-term infants, infants of low birth weight (<2500 g) were almost 3 times as likely to have cataracts (RR, 2.90; 95% CI, 1.77-4.75). This relation was not evident among the isolated cataracts group. No significant differences were observed in the rates of cataracts in infants occurring as a multiple birth (twins or higher) compared with singletons. Analysis using the Walter and Elwood test for seasonal variation[25] showed no significant trends in distribution of all cases by birth month ($P=.34$).

Thirty-eight percent of infants with isolated cataracts had their conditions diagnosed after the age of 6 weeks and 15% after the age of 5 months (**Figure 2**). The mean age at diagnosis of isolated cases was 60 days, with a median age of 1 day. The mean age at diagnosis of unilateral cataracts among the isolated cases was 57 days and 85 days for bilateral cataracts. During the 31 years of the study, the percentage of case infants who had their conditions diagnosed by 6 weeks of age was 63% (1968-1977), 60% (1978-1987), and 63% (1988-1998).

Information on the laterality of the cataracts was available for 168 infants (84%). Isolated cataracts were more often unilateral, whereas infants with multiple defects or syndromes more often had bilateral cataracts (**Table 3**). The risk factors discussed herein were also examined among isolated cataract cases by laterality (unilateral vs bilateral). Bilateral cataracts were significantly more likely among infants born to women 35 years or older (RR, 2.94; 95% CI, 1.19-7.29) and infants of birth weights less than 1500 g (RR, 5.23; 95% CI, 1.56-17.52). These relationships were not observed for unilateral cataracts.

Of the pregnancy exposures noted in the medical record, diabetes mellitus was noted among mothers of 5 nonsyndromic infants (4 with isolated cataracts and 1 with multiple defects). Active herpes infection during early pregnancy was noted in 1 infant with isolated cataracts.

COMMENT

The rate of cataracts diagnosed in the first year of life in our study was 2.03 per 10000 live births. Previous population-based studies have demonstrated rates of 0.6,[1] 2.3,[2] 3.46,[10] 3.6,[11] 3.7,[12] 4.7,[13] and 6[14] per 10000 births, but these studies used different case definitions (different ages of diagnosis) and diverse case ascertainment methods. The rate found in Spain (0.6 per 10000 births)[1] was considerably lower than ours, but cases were limited to diagnoses made in the first 3 days of life. A higher rate was found in a study by Rahi and Dezateaux[10] (3.46 per 10000), but this rate was based on cases diagnosed before age 15 years; their rate of cataracts in the first year of life was 2.49 per 10000, similar to that found in our study. A higher rate of 3.7 per 10000[12] was based on mass screening in China and apparently included older ages. Higher rates were also found in other studies[11,13,14] that included diagnoses made at later ages and likely included some children with milder disease. Our rate is consistent with that from another study[2] that similarly was based on diagnoses made in the first year of life.

The rate of infantile cataracts remained relatively stable throughout the years of our study, suggesting that exposure to risk factors for cataracts has not varied significantly during the study period. However, an increased number of cases was observed in 1977 and 1979. Some of this increase could have been accounted for by an increase in rubella infection among women of childbearing age.[26,27] Although only one of the infants in our series during this period was documented as having congenital rubella syndrome, some other infants may have been affected, but the diagnosis may not have been documented in hospital records or captured by abstractors.

The proportion of isolated cases found in our study (59%) was also similar to that found in a study from the United Kingdom (55%),[10] although the definition of isolated used in that study (not associated with another ipsilateral ocular anomaly or a systemic disorder) differed somewhat. In a study from Spain,[1] a lower proportion of cases were isolated (35%), but this may result from differences in their case definition (diagnosis in the first 3 days of life). Isolated cataracts may be less likely to be diagnosed early than those associated with multiple defects or syndromes.

Of our cases, 22% were classified as syndromes, similar to the findings of 23% from Spain.[1] In their study, 25% of cases were monogenic, whereas only 6% of our cases were classified as single-gene conditions. Eight (4%) of our cases were presumed to be autosomal dominant based on a history of congenital cataracts in at least 1 parent noted in the medical record, similar to the finding of a Canadian hospital-based study.[28] A higher proportion of cases was classified as hereditary in 2 other studies,[29,30]

but in these studies, parents underwent ophthalmologic examination, and thus, more mild forms of cataracts may have been identified. Our study depended on family history documented in the medical record and likely ascertains primarily visually significant forms of cataracts. Other single-gene conditions found in our study included 3 cases of chondrodysplasia punctata and 1 case of galactosemia, conditions that have been previously reported to be associated with cataracts.[31,32] The chondrodysplasia punctata was noted to be the autosomal recessive, rhizomelic form in 2 cases, whereas in the third case, the type was not specified.

Twenty-three infants (12%) had chromosomal abnormalities, similar to the findings of the study from Spain.[1] The most commonly observed chromosome abnormality was trisomy 13, a previously recognized association.[33] The proportion of infants with trisomy 13 was higher in our study than in previous studies. The reason for this is unknown but may be related to the fact that, in some other studies, infants may not have had trisomy 13 or cataracts diagnosed before their death.

Overall, 4% of cases were classified as secondary to teratogenic exposures (alcohol, rubella, and toxoplasmosis), a percentage similar to that found in the study from Spain.[1] We observed 3 infants (2%) with cataracts and congenital rubella syndrome, all occurring in the early years of our study (2 cases in 1968 and 1 in 1977). Two studies[29,30] from India have reported higher rates of congenital rubella among their cataract cases, but these studies used screening of rubella titers to detect cases. A high rate (19.1%) was also found in a study from Canada,[28] but this study was performed before availability of the rubella vaccine.[34] Although our low rate of congenital rubella syndrome may be related to the success of rubella vaccination programs in the United States, some infants with congenital rubella syndrome in our study might have been missed because we used information from medical records rather than data from serologic studies. A recent report suggests that although the rate of congenital rubella syndrome has substantially declined in the United States, the syndrome continues to occur, primarily among infants of foreign born women.[34]

Other cases that were presumed to be caused by teratogenic exposures included 4 cases of fetal alcohol syndrome and 1 case of toxoplasmosis. Both have been documented as causes of cataracts[35,36] and, as with rubella, are amenable to primary prevention. Some cases, although not classified as syndromes, also might have been associated with teratogenic exposures. These include 1 infant whose mother was diagnosed with herpes infection in early pregnancy and 5 infants whose mothers had diabetes mellitus. The infant with prenatal exposure to herpes had no other features of congenital herpes infection and therefore was not classified as having a syndrome; however, the cataracts in this infant might have been related to this exposure.[37] Maternal diabetes mellitus has been shown to cause congenital cataracts in some animal models[38] but has not been clearly identified as a cause of infantile cataracts in humans. Because our study did not have a control population, we are unable to determine whether diabetes is a risk factor for infantile cataracts. In addition, our data are limited to information abstracted from the medical record, so the number of cases attributable to teratogenic exposures is likely to be underestimated.

Most of our cases (for which laterality was known) were unilateral, in contrast to the predominance of bilateral cases in a previous study of infantile cataracts.[39] Our study found that cataracts were frequently associated with other eye defects, as has been previously documented. The 2 most common additional eye defects found in our study were microphthalmia and persistent hyperplastic primary vitreous, associations that have been previously reported.[1,25,26] None of the infants in our study were identified as having the microphthalmia-cataract syndrome[40]; however, 1 infant with microphthalmia and cataracts was reported to have a mother, maternal aunt, and grandmother with the same defects, suggesting that this family may have had this condition.

In more than half of the infants in our study who had isolated cataracts, the diagnosis was made or suspected in the first 6 weeks of life, similar to a recent study from the United Kingdom,[39] but a substantial number of infants had not had their cataracts diagnosed by that time. Although it is difficult to definitively determine age of onset, many of the cataracts would be expected to be congenital,[41] underscoring the need for direct ophthalmoscopic examination of the red reflex in the newborn period.[42] We did not identify any trend toward later diagnosis of cataracts with the advent of early hospital discharge of newborns.[43]

We found no significant differences in risk based on sex. This finding is consistent with 2 previous studies[28,39] where both sexes were equally represented but differs from the 2:1 ratio found in northern India[30] and the 3:2 ratio of affected males to females found in southern India.[29] The authors of the southern India study have hypothesized that males are more likely to receive medical care than females in India, and this may account for the aberrant sex ratio observed there.

We found a significant association between infantile cataracts and both low birth weight and prematurity. An association between several other birth defects and low birth weight[44] and prematurity[45] has been previously recognized, and an association between low birth weight and cataracts has been reported.[28] The observed relation with prematurity may be secondary to other complications, such as anoxia or hypoxia,[46] or could be due to infants with transient cataracts, a phenomenon that has been observed in premature infants.[41] Another possibility is that this association could be related to the increased ophthalmologic surveillance of premature infants, instituted for retinopathy of prematurity, resulting in ascertainment of mild, visually insignificant cataracts in premature infants that would possibly go undiagnosed or be diagnosed as an outpatient in a child of full-term gestation. Since data were not routinely available on extent of opacification, we are unable to determine if cataracts observed in premature infants were more likely to be mild, consistent with this hypothesis.

Our study has several limitations. Data on infants with cataracts are based on information abstracted from hospital medical records; thus, infants in whom the diagnosis was made in an outpatient setting may have been

What This Study Adds

Infantile cataract is an important cause of childhood visual impairment. Early detection and intervention are recommended to provide the best visual outcomes for affected infants. This study describes the epidemiologic characteristics of infantile cataracts in a major metropolitan area during a 31-year period. Twenty-two percent of infants with cataracts had recognized chromosome abnormalities, single-gene conditions, or teratogenic exposures. A number of infants with isolated cataracts had their conditions diagnosed after 6 weeks of age, underscoring the need for direct ophthalmoscopic examination of the red reflex in the newborn period to facilitate successful detection and treatment.

missed. However, most infants with clinically significant cataracts will undergo surgical treatment, so these infants would be ascertained at the time of their surgery since information on both inpatient and outpatient pediatric ophthalmologic surgical procedures in metropolitan Atlanta are included in hospital medical records. Although the sensitivity of MACDP for ascertainment of infantile cataracts is unknown, previous studies[47] have shown that its sensitivity for birth defects approaches 95%. Another limitation is that specific information from the ophthalmologic examination on the morphologic structure, location, and extent of opacification was often not available to us. This limits our analysis of cataracts and other accompanying eye defects, such as microphthalmia. Since information on extent of opacification was not routinely available to us, this information could not be used as part of our inclusion criteria. Another limitation is that some infants may be incorrectly classified as having cataracts as an isolated defect, as one of multiple defects, or as part of a syndrome. The classification was based on information regarding other defects or syndromes abstracted from the hospital medical record. Thus, information regarding diagnoses of additional major defects or syndromes not available in the hospital medical record (eg, made as an outpatient) were not available to us and could have resulted in inappropriate classification. In addition, infants were classified in the syndrome category only if cataracts were a known association with the syndrome; thus, 2 infants (1 with albinism and 1 with Cornelia de Lange syndrome, both not recognized as having cataracts as a feature[48,49]) were not classified as having syndromes. However, these conditions may have been the cause of the cataracts in these 2 cases. Some syndromes may not have been recognized; for example, 1 infant in our study had cataracts and schizencephaly, which may represent a newly recognized syndrome.[50] Another limitation is that, for nearly all the years of our study, MACDP only ascertained defects diagnosed or suspected within the first year of life. Therefore, we limited our case definition to infants who had their conditions diagnosed before their first birthdays. We are aware of 2 children diagnosed as having cataracts at age 15 months and 2 years, 11 months that were not included in our study because of this case definition. This issue particularly limits our examination of age at diagnosis. In a recent study from the United Kingdom,[39] 30% of diagnoses were made after the child reached 1 year of age. The analysis of age at diagnosis was also problematic in that it focused on infants with isolated cataracts; information on the age at diagnosis of cataracts in infants with multiple defects or syndromes was unavailable.

This population-based study is useful in describing the epidemiology of cataracts in a major metropolitan area over many years. In contrast to the relatively homogeneous populations previously investigated, the metropolitan Atlanta population provided the opportunity to examine race as a risk factor. Additionally, the time span of the study allows examination of how health care trends (eg, rubella immunization programs and earlier hospital discharge of well newborns) may affect the occurrence and detection of infantile cataracts. Other studies (eg, the National Birth Defects Prevention Study,[51] a large, ongoing, population-based, case-control study with collection of extensive interview data and DNA specimens) will allow a closer examination of genetic and environmental factors that may play a role in the etiology of infantile cataracts.

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