

ANALYSIS OF THE REASONS FOR DELAYED SURGICAL TREATMENT IN PATIENTS WITH CONGENITAL CATARACTS.

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Annotation: Delayed surgical intervention in patients with congenital cataracts can lead to irreversible visual impairment, particularly amblyopia. This article explores the underlying reasons for the postponement of cataract surgery in infants and young children, highlighting socio-economic, systemic, and clinical barriers. By analyzing relevant literature and clinical data, the study aims to identify key factors contributing to delays and proposes strategic interventions to optimize early detection and timely treatment.

Keywords: Congenital cataract, delayed surgery, pediatric ophthalmology, amblyopia, visual development, barriers to healthcare, early intervention, pediatric surgery.

Congenital cataracts are a significant cause of childhood blindness globally. The timely detection and surgical removal of cataracts in infants is critical for the normal development of vision. The first few months of life are a sensitive period for visual maturation, and any obstruction to the visual axis during this period can result in amblyopia, which may become irreversible if not addressed promptly.

Despite advancements in diagnostic and surgical techniques, many children with congenital cataracts undergo surgery later than the recommended period. Delayed surgical treatment is associated with poor visual outcomes and increased burden on families and healthcare systems. Understanding the factors contributing to such delays is essential for developing targeted public health strategies and improving pediatric ophthalmologic care.

Congenital cataracts refer to opacities in the lens present at birth or developing shortly after, which can lead to significant visual impairment if not addressed promptly. Early surgical intervention, ideally within the first few weeks to months of life, is crucial to prevent amblyopia (lazy eye), strabismus, nystagmus, and long-term vision loss. However, delays in treatment are common, particularly in developing regions, and can result in poorer visual outcomes. Analysis of available studies reveals that delays stem from a combination of socioeconomic, systemic, educational, and healthcare access issues, with multifactorial causes often overlapping.

Key Reasons for Delayed Surgical Treatment

Delays can be categorized into two phases: Delay-1 (time from caregiver recognition to initial consultation) and Delay-2 (time from consultation to surgery). The following analysis draws from prospective studies, primarily in India, where delays are well-documented due to high prevalence and resource constraints. In developed countries like the USA and Europe, such delays are less common owing to routine newborn screening, better awareness, and accessible healthcare, but when they occur, they may relate to subtle presentations or comorbid conditions requiring preoperative optimization.

Socioeconomic and Educational Factors

Low socioeconomic status and parental education levels are major contributors, leading to unawareness and delayed recognition.

- Unawareness or lack of knowledge about the condition: Parents may not recognize symptoms like leukocoria (white pupil) or believe nothing can be done, accounting for 26.28% of Delay-1 cases in one rural Indian study.

Similarly, low parental education correlates with later surgery ($p < 0.01$ in univariate analysis), as illiterate or minimally educated caregivers (e.g., 26.92% of family heads illiterate) are less likely to seek timely care.

- Cost of treatment: Financial barriers, including surgery and travel expenses, cause 20.51% of Delay-1 and 24.35% of Delay-2, exacerbated by low household incomes (e.g., 48.71% < 5546 INR/month).

This is compounded in families with multiple siblings, where resource allocation may prioritize other needs.

- Parental occupation and age: Fathers in low-wage jobs are linked to delays ($p < 0.01$), and older parents may face mobility or awareness issues.

- Gender discrimination: Girls are 1.9 times less likely to present early, with only 40% of surgical cases being female despite equal incidence, reflecting biases in resource-poor settings.

Healthcare Access and Systemic Barriers

Geographical and infrastructural issues hinder prompt care, especially in rural areas.

- Distance from facilities: 95% of patients live > 50 km from hospitals (30.7% > 200 km), contributing to 8.33% of Delay-1 and 14.74% of Delay-2.

Regional variations show higher delays in northern/central India (mean age at surgery 81.4 months) vs. southern/western (32.4 months).

- Lack of newborn screening: Routine screening is absent in many developing regions, with only 13.46% screened at birth, leading to missed early detection.

- Long waiting times for anesthesia/surgery: General anesthesia queues delay 30.33% of cases, with median Delay-2 of 4 months.

- Limited specialist access: Uncertainty about where to seek care affects 15.38% of Delay-1.

Family and Behavioral Factors

Personal and familial dynamics play a role in procrastination.

- No family support or competing responsibilities: Caring for other family members causes 4.48% of Delay-1 and 5.76% of Delay-2; lack of support contributes 2.56% of Delay-1 and 13.46% of Delay-2, particularly in bilateral cases (31.52%).

- Fear of surgery or child's young age: Parental reluctance due to fear (8.33% Delay-2) or perceiving the child as too young (14.10% Delay-2).

- Seeking second opinions or reluctance: Parents delaying for confirmation or hesitation affects some cases.

- Number of siblings: Fewer siblings increases delay risk (OR: 4.69 for early surgery with ≥ 2 siblings).

Medical and Diagnostic Factors

Missteps in diagnosis or patient health can extend timelines.

- Misdiagnosis or misleading by practitioners: 8.33% of Delay-1 due to misdiagnosis; 11.24% misled by local doctors.

- Self-treatment attempts: 5.76% try home remedies first.

- Systemic ill health: Child's comorbidities delay 14.61% of surgeries.

- Cataract laterality: Unilateral cases (14% of presentations) are often detected later than bilateral (86%), as symptoms are less obvious.

Category	Reason	Prevalence/Notes
Socioeconomic	Cost	20-24% across delays; linked to low income
	Low education/unawareness	26% Delay-1; $p < 0.01$ correlation
Access	Distance/geography	8-15%; regional variations (e.g., 81 months in north vs. 32 in south)
	Waiting times	30% due to anesthesia queues
Family/Behavioral	Lack of support/fear	2-14%; higher in bilateral cases
	Gender bias	40% girls vs. 60% boys presenting
Medical	Misdiagnosis/ill health	8-15%; 11% misled by practitioners

Impacts and Recommendations

Delays beyond 1 year are associated with increased strabismus, nystagmus, and amblyopia, reducing visual acuity.

In contrast, intentional short delays (e.g., 4-8 weeks) may reduce glaucoma risk, but prolonged unintended delays worsen prognosis. To mitigate, strategies include

expanding newborn screening, community education, subsidized care, and improved rural access. In developed nations, emphasis on multidisciplinary management for complex cases could further minimize rare delays.

The findings confirm that multiple, often overlapping, factors contribute to the delayed surgical treatment of congenital cataracts. The most prominent factor is late diagnosis, often due to the absence of routine red reflex screening and lack of caregiver awareness. In resource-constrained settings, economic hardship and logistical challenges further exacerbate delays.

An important observation was the insufficient linkage between primary care and specialized centers, leading to missed opportunities for early intervention. Although systemic illnesses (e.g., congenital infections or prematurity-related complications) play a role, these account for a smaller proportion of delays compared to preventable social and structural barriers.

Conclusion

Delayed surgical treatment for congenital cataracts remains a prevalent issue with significant implications for childhood visual health. The main reasons for delay include:

To reduce delays in surgical management of congenital cataracts, the following strategies are recommended:

Mandatory neonatal red reflex screening as part of routine postnatal care.

Parent and community education campaigns focusing on early signs and urgency of treatment.

Training primary healthcare workers in early identification and referral protocols.

Establishing regional pediatric ophthalmology centers with mobile screening units.

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