

## Tertiary Eye Care Centre Model for Development of Paediatric Cataract Surgery Services in Developing Countries

Shrestha UD

Paediatric Ophthalmology Unit, Tilganga Institute of Ophthalmology, Kathmandu, Nepal.

### ABSTRACT

It is estimated that every minute a child becomes bilaterally blind in developing nations. Paediatric cataract blindness presents an enormous problem to developing countries in terms of the human social burden, economic loss, and morbidity. The management of the paediatric cataract is lens aspiration with intra ocular lens implantation with anterior vitrectomy. The surgery should be performed by paediatric ophthalmologist in tertiary eye care centres. Facilities of general anaesthesia should be available in these centres and the operating theatres should be well-equipped with vitrectomy machine, biometry and portable keratometer.

**Keywords:** Blindness, paediatric cataract, tertiary eye care centre

Of the 1.5 million blind children in the world, 1.3 million live in Asia and Africa, and 75% of all the causes of this blindness are preventable or curable. The prevalence of blindness varies according to the socioeconomic development of the country and the under-five mortality rate. In developing countries the rate of blindness can be as high as 1.5 per 1000 population. Compared to industrialised countries, this figure is 10 times higher.<sup>1</sup> About 0.5 million children become blind each year.<sup>2</sup> For those who survive childhood, the burden of disability in terms of "blind years" is huge. The child who goes blind today is likely to remain so till 2050.<sup>3</sup>

The avoidable causes of childhood blindness according to Vision 2020 are corneal scarring, refractive error, congenital cataract, congenital glaucoma and retinopathy of prematurity. Accounting for 8% to 39% of all cases, cataract is one of the most treatable causes of blindness in children.<sup>4</sup> The prevalence of blindness from cataracts in children of developing countries is probably one to four per 10,000 compared with approximately less than one per 10,000 children in the industrialized world.<sup>3</sup>

Managing cataracts in children remains a challenge as treatment is often difficult, tedious, and requires a dedicated team effort. To assure the best long term outcome for cataract blind children, appropriate paediatric surgical techniques need to be defined and adopted by ophthalmic surgeons of developing countries. The high cost of operative equipment and the uneven distribution of ophthalmologists and anaesthetists create unique challenges.<sup>5</sup> The future of any society are children. Hence the management of paediatric cataract blindness needs to be addressed in developing countries like Nepal. This will help to achieve one of the goals of Vision 2020.

Most of the eye hospitals in Nepal are competent to provide high quality eye services. An adult can undergo cataract surgery at the nearest eye hospitals or in microsurgical eye camps. However, in case of paediatric cataract, this is not always practical. Parents and

### Correspondence:

Dr. Ujjowala Devi Shrestha  
Paediatric Ophthalmology Unit  
Tilganga Institute of Ophthalmology  
National Academy of Medical Sciences, NAMS  
Phone: 4493775  
Email: ujjowala@gmail.com

guardians would rather not have their children undergo cataract operation due to geographical challenges and a poor socio-economic condition. In a developing country like Nepal, the exact magnitude of burden of childhood blindness is not known. To date, there are only eight paediatric ophthalmologists in Nepal. Therefore, paediatric cataract surgery, in my opinion, should be promoted in at least one developmental zone.

Since the early 90s, there has been a step-by-step advancement in paediatric eye care services at different tertiary eye care centres. In the past, paediatric cataract surgery used to be done under ketamine. Today the surgery is performed under general anaesthesia.

The management of paediatric cataract is surgery. The surgical technique for paediatric cataract is lens aspiration, anterior vitrectomy and intra-ocular lens (IOL) implantation. Anterior vitrectomy must be done to prevent visual axis opacification (VAO) in children.<sup>6</sup> Hence the tertiary eye hospitals should have a vitrectomy machine for paediatric cataract surgeries. For IOL power calculation, a facility of biometry under general anaesthesia should be available. IOL implantation in children without biometry will lead to an unpredictable refractive status. Accutome A-scan and Nidek Handheld keratometer are the portable ones available for paediatric cataract IOL power calculation.<sup>7</sup> Paediatric ophthalmology subspecialty needs a team approach to be successful and identifying modalities of training a composite team of ophthalmologists, orthopticians, optometrists, nurses, anaesthesiologist and counsellors needs to be addressed. The World Health Organisation (WHO) strongly recommends the team approach. WHO suggests that there should be one paediatric ophthalmology service centre for every 10 million population, where at least one specialty-trained or oriented ophthalmologist should be available.<sup>8</sup> Earlier, the human resources involved in paediatric cataract surgery at different tertiary eye centres were general ophthalmologist, anaesthesiologist and ophthalmic assistants. Today, the involved team are paediatric ophthalmologists, paediatric anaesthesiologists, paediatric ophthalmic nurses and paediatric anaesthetic technicians.

One of the zonal eye hospitals can be established as the referral centre for paediatric eye care service. As per the target of Vision 2020 for human resource development, referral hospitals can train the ophthalmologists in a paediatric ophthalmology fellowship. The opportunity for short-term or long-term paediatric ophthalmology fellowship should be given to general ophthalmologists who are interested in paediatric ophthalmology by the zonal hospitals. This training program can be conducted at the tertiary eye care centres which are providing paediatric ophthalmology services by paediatric ophthalmologists. Paediatric ophthalmic assistants have a vital role in pre-operative counselling and post-operative visual rehabilitation. Tertiary eye care centres have trained ophthalmic assistants for paediatric eye care services. The zonal eye hospitals can identify the ophthalmic technicians for work in their paediatric eye care service. A short-term training on paediatric eye care for three months can be given at the national level in the referral tertiary centres.

Until recently, tertiary eye care centres had general ophthalmologists to perform paediatric cataract under Ketamine. Neither a vitrector nor biometry was used. Today, paediatric cataract surgery is performed by paediatric ophthalmologist, under general anaesthesia. Biometry is done under general anaesthesia in all cases. Zonal eye hospitals should provide the opportunity for the general ophthalmologists for a fellowship in paediatric ophthalmology in the tertiary referral centres. Similarly, short-term training should be given to the ophthalmic technician at the tertiary referral centres. Then the zonal hospitals should focus on the supply of necessary equipments for paediatric cataract surgery, with vitrectomy machines, A-scan ultrasonography, and portable keratometry for IOL power calculations available.<sup>9, 10</sup> Hospitals should set up the general anaesthesia facilities as well. As per the target of Vision 2020, all the tertiary eye care hospitals should have an adequate supply of consumables like aphakic glasses and intra-ocular lens in a wide range of powers. In conclusion, referral centers for pediatric cataract management must be properly equipped and staffed. The ophthalmologist and ophthalmic technicians should receive appropriate hands-on training.

## REFERENCES

1. Gilbert C, Foster A. Childhood blindness in the context of Vision 2020—the right to sight. *Bull World Health Organ.* 2001;79:227–32.
2. Foster A, Gilbert C. Epidemiology of childhood blindness. *Eye.* 1992;6:173–6.
3. Foster A, Gilbert C, Rahi J. Epidemiology of cataract in childhood: a global perspective. *J Cataract Refract Surg.* 1997;23:601–4.
4. Wilson ME, Trivedi RH. Childhood blindness and paediatric cataract. *Cataract and Refractive surgery today.* 2005:52–4.
5. Wilson ME, Pandey SK, Thakur J. Paediatric cataract blindness in the developing world: surgical techniques and intraocular lenses in the new millennium. *Br J Ophthalmol.* 2003;87:14–9.
6. Kugelberg M, Zetterstrom C. Pediatric cataract surgery with or without anterior vitrectomy. *J Cataract Refract Surg.* 2002;28(10):1770–3.
7. Trivedi RH, Wilson ME. Keratometry in pediatric eyes with cataract. *Arch Ophthalmol.* 2008;126(1):38–42.
8. Murthy GVS, N John, MCA, Gupta SK, Vashist P, Rao GV. Status of pediatric eye care in India. *Indian J Ophthalmol.* 2008;56(6):481–8.
9. Wilson ME, Trivedi RH. Pediatric cataracts in developing-world settings. In: Wilson ME, Trivedi RH, Pandey SK, editors. *Pediatric Cataract Surgery: Techniques, Complications and Management.* Baltimore, MD: Lippincott Williams & Wilkins; 2005.p. 303–7.
10. Yorston D. Surgery for congenital cataract. *J Comm Eye Health.* 2004;17(50):23–5.