Tackling blindness due to Retinopathy of Prematurity (ROP) in low and middle income countries.

**The history of Retinopathy of Prematurity** must be as old as the history of the survival of premature infants. Retinopathy of Prematurity (ROP), previously termed as Retrolental Fibroplasia, is a vaso-proliferative condition of Retina which is one of the major causes of childhood blindness and visual morbidity in the surviving premature infants. ROP is one of the priority diseases of Vision 2020 and ranks fifth among all other causes of childhood blindness in the world. It has a well-established classification system, the natural history of the disease is known, signs develop within 3-4 weeks after birth with rapid progression. In around 70% of these infants, the condition resolves without treatment. 20-30% of cases progress to sight threatening ROP that need treatment.

**Two epidemics of ROP have been described** in industrialized countries. It was during the 1940s and 1950s in these countries where ROP was first noticed as a significant cause of blindness among infants. At that time, the survival rate of premature babies increased due to the use of supplemental unrestricted oxygen. That era was known as the “first epidemic.” Thereafter, blindness from ROP diminished with the restriction of oxygen, but there was an increase in mortality rates and cerebral palsy. The “second epidemic” started in the 1970s as neonatal care improved over time with use of mechanical ventilation and better modalities of monitoring oxygen supplementation and improved control of neonatal and perinatal complications. Lower weight preterm babies survived in 1980s and blindness from ROP re-emerged.

ROP can be controlled through 2 broad approaches: a) excellent neonatal care, and b) detecting and treating infants who develop the severe stages of the disease. The World Health Organization estimates that there are 15 million preterm births per year (born at <37 weeks). Risk of ROP is more in those born at <32 weeks gestational age and birth weight <1.5 Kg. Only preterm babies cared for in neonatal intensive care units develop ROP. In most of our South Asian countries, with rapidly developing neonatal intensive care systems and limited health resources, blindness due to ROP has recently emerged as an increasing problem in bigger premature infants as well. Common reasons why infants in these countries become blind from ROP include:

- The unit in which they are treated lacks services for the detection and/or treatment of ROP
- The infant exceeds birth weight criteria for examination and hence is not screened for ROP
- The examination and treatment aren’t carried out effectively
- The baby is exposed to excess oxygen due to lack of or poor oxygen saturation measuring techniques.

The strategies for management of ROP must be approached with an all-inclusiveness of Family Health Division, Child Health Division and integration of screening program for premature babies. Foremost is primary prevention of preterm births, the causes of which are multifactorial. It has been shown that reducing teenage pregnancies, preventing multiple births (i.e. in vitro fertilization), and avoiding unnecessary caesarian sections may reduce premature births. Improvement of neonatal care with specific interventions that decrease infection and use oxygen more judiciously can reduce the risk. Current modalities, such as the use of 1) blenders (systems that deliver oxygen in varying amounts); and 2) probes/monitors (measure blood oxygen levels) account for better oxygen monitoring. Periodic training of staffs on the importance of neonatal life support should not be underestimated. Secondary prevention of ROP involves early identification and treatment to prevent the consequences of the disease. This can be done in the following ways: 1) The neonatologist identifies infants to be examined according to gestation age, birth weight, or other criteria; 2) the ophthalmologist visits the neonatal unit on a fixed day and time each week to examine the infants using an indirect ophthalmoscope.

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Tele-screening with RetCam (wide field digital fundus camera) by a non-ophthalmologist may offer a viable solution for timely detection of treatable ROP, especially in areas where a trained ophthalmologist is not available.

The advantages of a RetCam are the following: it can take images to track change over time and is useful for educating staff and counselling parents. The camera is portable and can be used in more than one unit. Yet, the device does not provide a substitute for a trained ROP screener. It is a form of documentation that still needs interpretation by an ophthalmologist. The challenge of its use is that the report must be fed back to the screener within 48 hours in case treatment is urgent. This requires a 24/7 real time access to remote experts. Since ROP is not present at birth, but develops during the first few weeks of life, the first screening examination should take place no later than 30 days after birth. Follow-up screening is often needed, and may be done after the baby has been discharged from the neonatal unit. All babies who develop the sight-threatening stages of ROP must be treated urgently: within 48–72 hours. Peripheral retinal ablation with Diode Green or Infra-Red laser is still a gold standard for the treatment of ROP. However, aggressive posteriorROP and ROP in Zone 1 are less responsive to laser and require intra-vitreal injection of Anti-Vascular Endothelial Growth Factor (Bevacizumab 0.625 mg, Avastin; Genentech) or (Ranibizumab 0.2 mg, Lucentis; Novartis) as a single dose. Pediatric retinal surgery is required for progression to Stage 4 or 5. Lens-sparing vitrectomy (LSV) is the most exciting recent innovation used for most cases of Stage 4 ROP with a good outcome. Nearly 74% of anatomic and 63% of successful visual outcomes have been reported in Indian population with LSV for Stage 4 ROP.

Infants with ROP may have an increased risk for other pathologies, such as high myopia, squint, and cortical brain damage. They need regular follow up so these problems can be detected and managed. Hence, good relationships among parents, pediatricians, and other caregivers have to be instituted. Tertiary prevention involves rehabilitation in order to restore function, with special education so that these children will integrate soonest with the regular education system and be able to mix with normally sighted children. Moreover, support services must be made accessible to families afflicted with a visually disabled child. Thus, there is a need to develop and strengthen eye facilities, specifically for low vision care.

As with most public health interventions, evidenced-based health information through population researches would help in better planning of public health approach, policy development, and rehabilitative services for visually disabled children due to retinopathy of prematurity. Hence, any ROP program must be comprehensive in nature that needs to have good coverage, needs good information management system, constant coordination of screening and management, financial support for the equipment and training, and vigorous public awareness campaign in the country.

References:

FAQs on Refractive Surgery Services

Q. What are different Refractive surgeries performed at Tilganga Institute of Ophthalmology (TIO)?
Ans: Currently, TIO refractive surgery unit it performing
• Femto LASIK (Laser assisted in situ Keratomelasia)
• SMILE (Small Incision Lenticular Extraction)

Q. What is the cost of the surgery?
Ans: The current cost of the surgery is 80,000 per person. Above this you will be charged NRS 200 as registration fee and Rs 3500 for Initial screening (consultation charges with surgeon, optometrist and all test done within the department). If you need cross consultaion you will be charge as per the TIO price list.

Q. How long does it take to complete the procedure?
Ans: Before the procedure is done in your eyes, you need go through a detailed eye examination. Generally, if all is well you will complete these pre-tests in 2 appointments. The first appoint will be with the optometrist and the second one will be with the surgeon. These appoints are done on separate days. If you are found fit for the surgery in the pre-test, third appointment will be the surgery. We generally operate 3 days in a week. For now, it's (Sunday, Tuesday and Thursday). So, from the first appointment date you can complete all the procedure in 3-6 days, depending upon the slots of appointment available.

Q. What is age limit of the procedure to be carried out?
Ans: These procedures (Surgery) can be carried out once an individual is above 18 years of age. There is no upper limit of the age as long as the eye health is suitable.

Q. How long should we follow-up after the surgery?
Ans: Follow-up examination is the regular eye examination procedure which is carried throughout the life. This can be done with your local optometrist or ophthalmologist. But after surgery 1 week, follow up with the clinic is compulsory (if we feel it's necessary, we always extend this time period)

Q. What is the power range that can operated at TIO?
Ans: Currently we are operating
• Myopia from -0.50 to -14.00 Dipters.
• Hyperopia from +0.50 to +8.00 Dipters
• Astigmatism from 0.25D till 6.00D.
• We also have the procedure for presbyopia.
(There are other procedures where we can go beyond this range, this is explained during the consultation with the optometrist and the surgeon both. So people who have prescription out of these range can also book their appointment for other options)

Q. How can I book an appointment?
Ans: You can call at the +977-1-5970048 / 4484574 to book your appointment for initial screening. If you want to book you appointment through email you can always write to info@tilganga.org or alternatively you can write to the refractive surgeon shashwatdhungal@gmail.com or to an optometrist at drpurudhungana@gmail.com