Retinopathy of Pre maturity and Pediatric Services

An appeal for a new project vehicle

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The Vittala ROP Project

Retinopathy of Prematurity Defined

What is retinopathy of prematurity?

Retinopathy of prematurity (ROP) is a potentially blinding eye disorder that primarily affects premature infants weighing about 2000gms or less that are born before 36 weeks of gestation (A full-term pregnancy has a gestation of 38–42 weeks). The smaller a baby is at birth, the more likely that baby is to develop ROP. This disorder—which usually develops in both eyes—is one of the most common causes of visual loss in childhood and can lead to lifelong vision impairment and blindness. ROP was first diagnosed in 1942.

Frequently Asked Questions about Retinopathy of Prematurity

How many infants have retinopathy of prematurity?

Today, with advances in neonatal care, smaller and more premature infants are being saved. These infants are at a much higher risk for ROP. Not all babies who are premature develop ROP. There are approximately 21 million infants born in India each year; of those, about 350,000 weigh 2000 gms or less. About 100000 to 160000 of these infants are affected by some degree of ROP. The disease improves and leaves no permanent damage in milder cases of ROP. About 90 percent of all infants with ROP are in the milder category and do not need treatment. However, infants with more severe disease can develop impaired vision or even blindness. A large number of infants annually develop ROP that is severe enough to require treatment.

Are there different stages of ROP?

Yes. ROP is classified in five stages, ranging from mild (stage I) to severe (stage V):

Stage I — Appearance of a line in the retina demarcating areas with and without blood vessels. Many children who develop stage I improve with no treatment and eventually develop normal vision. The disease resolves on its own without further progression.

Stage II — Appearance of a ridge like structure in the retina demarcating areas with and without blood vessels. Many children who develop stage II improve with no treatment and eventually develop normal vision. The disease resolves on its own without further progression.

Stage III — Severely abnormal blood vessel growth. The abnormal blood vessels grow toward the center of the eye instead of following their normal growth pattern along the surface of the retina. Some infants who develop stage III improve with no treatment and eventually develop normal vision. However, when infants have a certain degree of Stage III and "plus disease" develops, treatment is considered. "Plus disease" means that the blood vessels of the retina have become enlarged and twisted, indicating a worsening of the disease. Treatment at this point has a good chance of preventing retinal detachment.

Stage IV — Partially detached retina. Traction from the scar produced by bleeding, abnormal vessels pulls the retina away from the wall of the eye.

Stage V — Completely detached retina and the end stage of the disease. If the eye is left alone at this stage, the baby can have severe visual impairment and even blindness.

Most babies who develop ROP have stages I or II. However, in a small number of babies, ROP worsens, sometimes very rapidly. Untreated ROP threatens to destroy vision.

Can ROP cause other complications?

Yes. Infants with ROP are considered to be at higher risk for developing certain eye problems later in life, such as retinal detachment, myopia (nearsightedness), strabismus (crossed eyes), amblyopia (lazy eye), and glaucoma. In many cases, these eye problems can be treated or controlled.

Causes and Risk Factors

What causes ROP?

The most important factor that causes ROP is premature birth.
ROP occurs when maturing blood vessels grow abnormally and spread into the vitreous cavity of the eye. These abnormal blood vessels are fragile and can leak, scarring the retina and pulling it out of position. This causes a retinal detachment. Retinal detachment is the main cause of visual impairment and blindness in ROP.

Several complex factors may be responsible for the development of ROP. The eye starts to develop at about 16 weeks of pregnancy, when the blood vessels of the retina begin to form at the optic nerve in the back of the eye.

The blood vessels grow gradually toward the edges of the developing retina, supplying oxygen and nutrients. During the last 12 weeks of a pregnancy, the eye develops rapidly. When a baby is born full-term, the retinal blood vessel growth is mostly complete (The retina usually finishes growing a few weeks to a month after birth). But if a baby is born prematurely, before these blood vessels have reached the edges of the retina, normal vessel growth may stop. The edges of the retina the periphery may not get enough oxygen and nutrients.

Scientists believe that the periphery of the retina then sends out signals to other areas of the retina for nourishment. As a result, new abnormal vessels begin to grow. These new blood vessels are fragile and weak and can bleed, leading to retinal scarring. When these scars shrink, they pull on the retina, causing it to detach from the back of the eye.

Are there other risk factors for ROP?

In addition to birth weight and how early a baby is born, other factors contributing to the risk of ROP include anemia, blood transfusions, respiratory distress, breathing difficulties, and the overall health of the infant.

In 1954, scientists funded by the National Institutes of Health in the US determined that the relatively high levels of oxygen routinely given to premature infants at that time were an important risk factor, and that reducing the level of oxygen given to premature babies reduced the incidence of ROP. With newer technology and methods to monitor the oxygen levels of infants, oxygen use as a risk factor has diminished in importance.

Treatment

How is ROP treated?

The first step is to ensure that no baby born prematurely is left unscreened. And every baby that is deemed to need treatment is given the treatment in the safest way possible.

The most effective proven treatment for ROP is laser therapy. Laser therapy "burns away" the periphery of the retina, which has no normal blood vessels. Laser treatment destroys the peripheral areas of the retina, slowing or reversing the abnormal growth of blood vessels. This saves the normal portions of the retina and hence saves vision.

Laser treatments are performed only on infants with advanced ROP, particularly stage III with "plus disease."

In the later stages of ROP, other treatment options include advanced surgery of the following kinds. However surgery has very poor outcomes :

- *Scleral buckle*. This involves placing a silicone band around the eye and tightening it. This keeps the vitreous gel from pulling on the scar tissue and allows the retina to flatten back down onto the wall of the eye. Infants who have had a sclera buckle need to have the band removed months or years later, since the eye continues to grow; otherwise they will become nearsighted. Sclera buckles are usually performed on infants with stage IV or V.
- *Vitrectomy*. Vitrectomy involves removing the vitreous. After the vitreous has been removed, the scar tissue on the retina can be peeled back or cut away, allowing the retina to relax and lay back down against the eye wall. Vitrectomy is performed only at stage V.

Why is this project needed?

As a part of the National Health Mission and its efforts to control early child deaths, the Government of India has established Neonatal intensive care units in every district of every

state in the country. This has been matched by the development of such units in private hospitals and nursing homes too.

As more and more babies are surviving, the need for screening and treatment of ROP has also exploded.

However, screening and treatment need highly specialized personnel and equipment. These skilled doctors are very few in number and are in large cities of the country, leaving a vast majority of children unscreened in many rural areas.

What is the Solution?

The Vittala ROP project begun in 2003 as a clinic based screening service was expanded into a mobile screening system covering multiple NICUS in the year 2009.
This new phase of the project has been delivering ROP screening in far flung NICUs using advanced RETCAM imaging system coupled with an innovative tele medical solution for diagnosis and treatment planning since 2009.
Treatment by laser photo coagulation is delivered in the NICU itself with minimal stress to the infant. We have been able to deliver more than 7800 screenings covering 2900+ infants in this phase of the project.
More than 200 babies have received laser therapy.

Between March 2009 and Jan 2014, the project covered 11 NICUs in 6 districts of the Southern Indian state of Karnataka.
In Feb 2014, at the invitation of the state government, the screening services have been expanded to cover government hospitals in 10 districts of the state. This brought the total NICUs in the screening net to 23. These NICUs are visited every week and the infants requiring screening are photographed, tele diagnosed and treatment delivered in the NICU where needed.

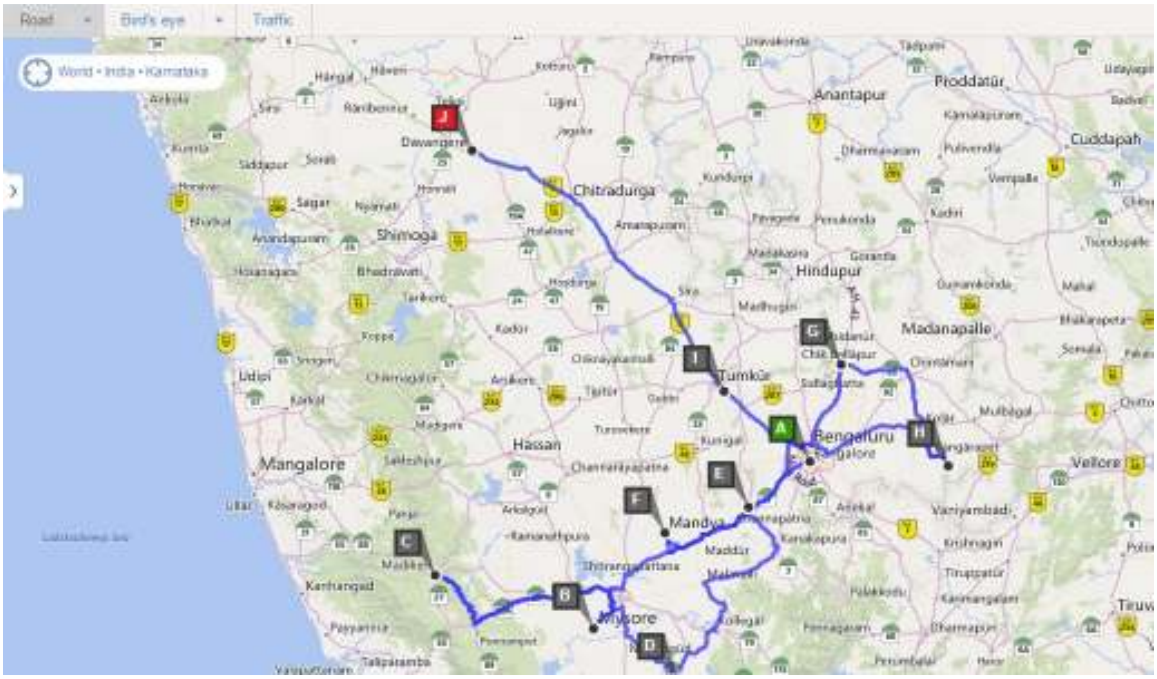
A movie about the project can be seen here

https://vimeo.com/83223742

The current appeal

The project is based on transporting a very expensive imaging system called the RetCam in a specially designated vehicle. The regular weekly route covered by the vehicle is shown below.

We seek your support in continuing to screen and treat these infants in far flung NICUs.



Recognition of the donation

VIIO will recognize the contribution of **all donors** with specific reports of the babies screened and treated.

About the institute

A look back in time

Started in 1988, **Sri Keshava Trust(SKT)** is a Bangalore based public charitable trust engaged in provision of health care services to those that need it the most. Focusing on eye care in particular, Sri Keshava Trust started in a small way out of Prabha Eye Clinic and Research Center.

Our Work is inspired by our founder **Dr K Ramachandramurthy (1943-2008)** a visionary ophthalmologist and a very respected pioneering legend in the area of eye care. Dr KRM as he was fondly called, dedicated his life towards providing quality eye care to his countrymen, at a time when such care was scarcely available. He gave us our motto ***"Shraddahi Paramagathihi"*** ***(Dedication is the ultimate goal)*** a tenet by which the institution functions to this day.


Dr KR Murthy 1943-2008

The driving spirit of the organization is to fulfill the dream of our founder, whose desire was to ensure that

"No one shall go blind for want of money or lack of care"

A need was felt to take diagnostic and treatment services to rural areas around Bangalore. Five rural ophthalmic clinics in Jigani, Anekal, Magadi, Hosur and Yelandur were started with the help of other NGOs and were run for over a decade.

In 1998 the Government of Karnataka granted us land in the new area of Banashankari III stage. Supported by over 3500 donors big and small, SKT built a state of the art tertiary care ophthalmic center called **Vittala International Institute of Ophthalmology (VIIO)**. This facility started offering its services since October 2001.Today the Hospital is equipped with the latest diagnostic and treatment equipment for all round eye care.

Sri Keshava Trust is a "Sustainable Charity" engaged in provision of eye care services primarily in the Southern Indian State of Karnataka. The Trust has its activities in clinical work, out reach programs and in research. The trust undertakes research and training in all areas of ophthalmology and is currently in the process of creating comprehensive care models.

Sri Keshava Trust has a very clear focus on affordable quality eye care by providing cost effective access to preventive and diagnostic care through unique Advanced Eye Care Mobiles. A successful economic model based on revenue sharing with existing medical establishments in the hinterland has proven successful .This model piloted through three separate units for various eye conditions have proven sustainable and has been replicated in over 17 locations. The institute offers Cataract, Corneal and Refractive, Retina, Glaucoma, Uvea and Ocular Inflammation, Pediatric, Custom Ocular Prosthesis, Low Vision, Community Ophthalmology and Clinical laboratory services.

Today the Institute has earned a name for itself as a Center of Excellence in various areas of Ophthalmology, and trains doctors and support staff from all over the world.

A story not limited to numbers

An unerring focus on clinical and surgical excellence has made VIIO a much sought after center for care

Nearly half a million people directly benefited from our services. **45**% of them received this care for free. **72**% of the remaining patients received concessions ranging from **10** to **90**%. **1500** outreach camps, **650,000** KM of mobile unit travel, **114** scientific papers and presentations, **19** postgraduate and **56** paramedical staff trained. All this would not have been possible without the support of our donors, patrons.