

The Experience of Retinopathy of Prematurity Screening Programme at Chittagong Ma O Shishu Hospital

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Abstract: **Aim:** To share the experience of ROP screening programme at NICU, Child Development Centre & department of Ophthalmology & Gynecology, CMOSH, Agrabad, Chittagong. **Methods:** •Number of premature babies, those are screened 160. •Duration of screening 01/01/2020 – 27/03/2021. •Place of screening: NICU, CDC & department of Ophthalmology & Gynecology, CMOSH. •Time of examination were at 28th-30th day after birth. **Procedure:** Thorough general examination of all the babies was done by expert neonatologist and Gynecologist. Babies were prepared by expert optometrist for indirect ophthalmoscopy. Pupils were dilated by Tropicamide eye drop. Surface anesthetic eye drops (0.4% oxybuprocaine eye drop) was given. Eye lids were aperted by pediatric wire speculum. Indirect ophthalmoscopy was done by trained ophthalmologist. Gentle indentation with wire Vectis or cotton bud. Well visualized the peripheral retina. **Results:** Total number of babies: 160. Approximate gestational age (AGA)= 28-38 weeks. Gestational body weight (GBT)= 1.00-2.80 kg. 30 cases were found abnormal retinal neovascularization & different stages of ROP & referred to retina specialist of tertiary Eye hospitals for needful. **Discussion:** There are different data of development of ROP in Bangladesh¹. ♦ Incidence of ROP is 4.4%. ♦ 19 of 53 screened babies need LIO. ♦ 9 cases out of 49 (18-36%). Our experience shows 30 cases had different stages of ROP out of 160 premature babies (18.75%), i.e., ROP incidence is increasing in our country. **Conclusion:** The facilities & management system of NICU, pediatric neurology & child development centers & Gynecological supports are developed & increased, survival rate of premature babies increased. So, we have to develop a comprehensive screening programme so that every premature and low birth baby is screened for ROP at 28th-30th day after birth.

Keywords: Retinopathy of Prematurity, Child development Centre, NICU, AGA, GBT & LIO

INTRODUCTION

Retinopathy of Prematurity (ROP) is a potentially blinding eye disorder that primarily affects, premature infants weighting about 1250 grams or less that are born before 31 weeks of gestation. The smaller a baby is at birth, the more likely that baby is to develop ROP. ROP is one of the most common causes of visual loss in childhood & can lead to lifelong visual impairment and blindness. ROP was first diagnosed in 1942 and in Bangladeshi children was first reported in 2004.

There are approximately 3.75 million infants born in Bangladesh each year out of those about 25,000 babies, weight is 1500 grams or less². These low-birth-weight infants are at a much higher risk of developing ROP. The incidence of ROP has increased due to the survival of low-birth-weight premature infants owing to availability of advanced NICUS services.

ROP as a cause of blinding disease in Bangladeshi children were first reported in 2004. Another study on 49 infants revealed that 13% neonates below 1500gm and born at or before 34 weeks suffer from low vision due to the effects of ROP.³ Another publication reported 5 out of 114 (4.4%) children were found to be blind due to ROP. All infants were born either before or at 33 weeks (30-32 weeks). In a hospital

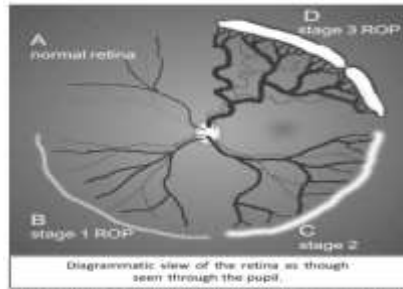
based study (2006-2007) in Dhaka Shishu Hospital revealed that 11.11% of the infants became blind out of 72 infants born between 27- and 34-weeks' gestation and birth weight between 750-1490 gm.⁴ In another report at a tertiary eye care center in Dhaka, out of 53 babies 19 babies needed LIO. We wanted to report our primary experience of ROP screening at our hospital.

Etiopathogenesis:

Primary risk factors include

- Low gestational age, especially < 31 WKS.
- Low birth weight (< 1500 gm, especially < 1250 gm)
- Supplemental oxygen therapy & other features like
- Respiratory distress syndrome, Asphyxia, Shock & Acidosis.

In premature birth, the production of VEGF is down regulated and vessels migration is halted. However, with growing age, because of increased metabolic demands, the oxygen regulated VEGFs & non-oxygen regulated insulin like growth factors (IGF-1) are produced in excess.



This diagram illustrates how ROP develops, usually progressing over time from Normal to Stage 1 through Stage 2 to Stage 3. Mild ROP of Stages 1 and 2 are very common and settle on their own. Only a small proportion of babies develop plus disease and Stage 3, which is more serious.

View the diagram starting at letter A. The blood vessels pointing towards A are normal.

At B there is a white line, at the growing tips of the blood vessels - Stage 1 ROP. The white line is the ROP.

At C the line has become thicker - Stage 2 ROP.

At D, the line is very much thicker because of the formation of very fine and abnormal new blood vessels. At D you can also see that the arteries have become very tortuous (wiggly) and the veins much fatter - both of these are known as plus disease and are signs that the eye needs treatment. To avoid too many diagrams, all ROP stages are shown in small sections as though they are in one eye, which they are not.

Different Stages of ROP

METHODS

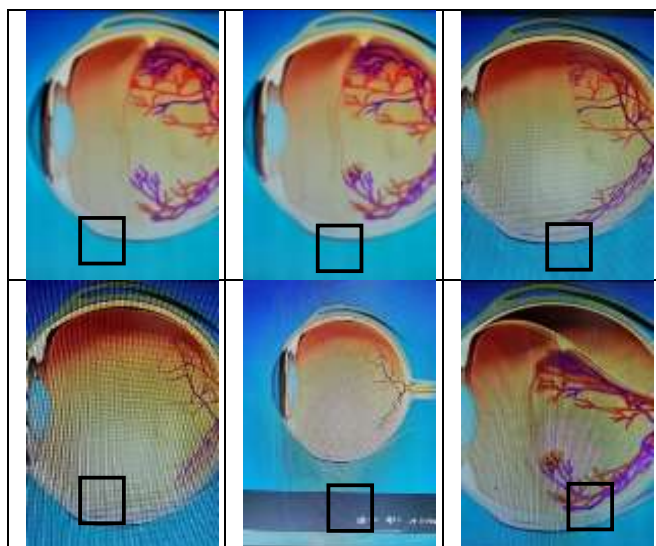
There is a well-developed neonatal intensive care unit in CMOSH, is serving for the last 20 years. We usually screened the babies at NICU at the 30th day after birth. Sometimes the babies were brought to our Ophthalmology department if they were discharged earlier. The pupils were dilated with half strength of commercially available combination eye drop of Tropicamide (0.8%) and Phenylephrine (5%), One drop was instilled 15 minutes apart for 2 to 3 times before examination. The eye drop was soaked with sterile cotton from the inner canthus of the eyeball; the babies were kept comfortable by wrapping with warm clothes. They were well fed and burped an hour before examination. Self retaining eye speculum was put to apart the eyelids and examination was done by indirect ophthalmoscope by a trained Ophthalmologist. The records were kept in an evaluation forms. If there is any abnormal retinal neovascularization seen, the baby is referred to respected retina specialists for further better management.



Pathogenesis: In normal development of retina, the vessels reach the nasal periphery after 8 months of gestation & temporal periphery about 1 month after delivery, by the effects of VEGF. Resulting in neovascularization and fibrous proliferation progressively resulting in different stages of retinopathy of prematurity.

Clinically, the evaluation of ROP has been divided into five stages:⁶

- Stage 1. Demarcation line formation at the edge of vessels, dividing the vascular from the avascular retina.
- Stage 2. The line structure of stage 1 acquires a volume to form a ridge with height and width.
- Stage 3. Ridge with extraretinal fibrovascular proliferation into the vitreous. This stage is further subdivided into mild, moderate and severe, depending on the amount of fibrovascular proliferation.
- Stage 4a. Subtotal retinal detachment not involving the macula is a feature of this stage. It occurs as a result of exudation from incompetent blood vessels or traction from the fibrous (cicatricial) tissue.
- Stage 4b. Subtotal retinal detachment involving the macula occur in this stage.
- Stage 5. Total retinal detachment which is always funnel-shaped



RESULT

There were 160 premature babies examined from 01-01-2020 to 27-03-2021.

Approximate gestational age is 28th to 48th weeks.

Gestational birth weight is 1kg to 2.8kg.

About 30 cases were found with abnormal retinal neovascularization & different stages of ROP. They were referred to retina specialists & different tertiary eye hospitals for better & needful management.

DISCUSSION

There were different data of development of ROP in Bangladesh.

- Incidence of ROP range from 21% to 65.18% in premature babies.⁷
- In infants weighting less than 900gms at birth with gestational age less than 25 weeks incidence is as high as 80% to 100%.⁸

- In India, in a tertiary neonatal care unit, birth weight less than 1500gms
- Incidence of ROP is 1.9%.⁹
- At Dhaka out of 53 babies 19 babies needs LIO.⁵

Our experience shows 30 cases out of 160 premature babies (18.75%).

RESULT

Here were examined total 160 premature babies from 01/01/2020 to 30/03/2021. Approximate gestational age is 28" t0 38h weeks. Gestational birth weight is 1 kg to 2.8 kg. About 30 cases were found with abnormal retinal vascularization & different stages of ROP. They were referred to retina specialists & different tertiary eye hospital for better & needful management.

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- In infants weighting less than 900 grms at birth with gestational age less than 25 wks. Incidence is as high as 80 to 100%.⁸
- In India, in a tertiary neonatal care unit, birth wt. less than 1500 gms & gestational age bellow 34 wks Incidence of ROP is 1.9%.⁹

At Dhaka out of 53 babies 19 babies need LIO (14)

Our experience shows 30 cases had different stages & abnormal neo vascularization of retina out of 160 premature babies (18.759%) i.e., ROP incidence is increasing in our country. This is the time to be aware of the severity of ROP in our country. All ophthalmologists especially retina specialists and pediatric ophthalmologists, neonatologists, pediatricians & Gynecologist should work together to fight the scenario.

CONCLUSION

We are determined to establish a comprehensive screening program so that every premature & low birth weight baby should be screened for ROP at 28th to 30th day after birth. All ophthalmologists especially retina specialists, pediatric ophthalmologists, neonatologists, pediatric neurologists& Gerontologist should be included at ROP screening program to fight against ROP.

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