



## RETINOPATHY OF PREMATURITY SCREENING PROGRAMME IN A TERTIARY CARE CENTRE: RASHTRIYA BAL SWASTHYA KARYAKRAM (RBSK) GUIDELINES

### Ophthalmology

**Dr Anjul Garg** MS

**Dr Abha Shukla\*** MS \*Corresponding Author

**Dr Prabha Gupta** MS

**Dr Rashmi kujur** MS

### ABSTRACT

**AIM:** Retinopathy Of Prematurity (ROP) is a retinal disorder seen in low birth weight and premature infants. It can be mild with no visual defects, or it may become aggressive with new vessels formation and progress to retinal detachment and blindness. Timely screening and treatment of ROP can prevent blindness. A screening program is needed for early diagnosis and secondary prevention of visual loss due to ROP in at-risk neonates.

**MATERIAL METHOD:** Retinopathy of prematurity screening programme started in a newborn care unit of a tertiary care eye hospital according to guidelines of Rashtriya bal swasthya karyakram; Ministry of Health & Family Welfare- Government of India 2017. Babies born before 36 weeks or birth weight < 2000 gm receive first screening at 4 weeks of birth and small infants with period of gestation less than 28 weeks or less than 1200 grams birth weight screened early at age of 2-3 weeks after delivery. These babies were followed up till retinal vascularization completes.

**RESULT:** Over a period of 6 months from September 2017 to March 2018 total of 321 preterm babies were screened for ROP. The incidence of ROP in 321 infants screened was 56 (17.44%). Stage 1 detected in 47 eyes, stage 2 in three eyes, and stage 3 in two eyes. Plus disease was seen in 4 eyes (1.2%).

**CONCLUSION:** Improved antenatal and postnatal care has given chances of survival to many premature babies, now their future sight is a combined responsibility of neonatologist, parents and ophthalmologist. Increasing burden require that all future and practicing ophthalmologist should participate in ROP screening programme.

### KEYWORDS

ROP screening , retinopathy, RBSS

#### INTRODUCTION:

Retinopathy of Prematurity (ROP) is a preventable cause of childhood blindness worldwide. It is a vasoproliferative disorder of retina seen in low birth weight and premature infants. The prevalence of ROP is lower in high-income countries, where risk factors such as oxygen administration and blood oxygen saturation are strictly monitored. Due to lack of awareness for risk factors related to ROP and shortage of skilled professionals in lower income countries leads to an increase in the incidence of retinopathy of prematurity.

In India various studies have reported the incidence of ROP as 20% to 52% With the improved survival of preterms and small-for-date neonates, after the operationalisation of NICUs (neonatal intensive care unit) across India, number of preterm babies with ROP also increases. Currently, India is facing the third epidemic of ROP.

WHO and Ministry of Health & Family Welfare Government of India under Rashtriya Bal Swasthya Karyakram (RBSK), creates guidelines for universal eye screening in newborns including retinopathy of prematurity by conducting workshops across India and spreading awareness amongst both neonatologists and ophthalmologists in paired sessions. Both neonatologists and ophthalmologists complemented each other, discussed ROP prevention and issued ROP screening and good neonatal care guidelines which were different from the American guidelines.

#### Rashtriya Bal Swasthya Karyakram (rbsk) Guidelines

Rashtriya Bal Swasthya Karyakram (RBSK) is an important initiative aiming at early identification and early intervention for children from birth to 18 years to cover 4 'D's viz. Defects at birth, Deficiencies, Diseases, Development delays including disability. Retinopathy of Prematurity is one of 30 selected health conditions to be screened under RBSK health for screening, early detection and free management.

ROP can be mild with no visual defects, or it may become aggressive with new vessels formation and progress to retinal detachment and blindness. Timing is one of the important factors that make the treatment successful in ROP, because the disease can advance very quickly and delay in treatment often reduces the chances of success. Timely screening and treatment of ROP can prevent blindness. A universal screening program is needed for early diagnosis and secondary prevention of visual loss due to ROP in at-risk neonates

#### MATERIAL METHOD:

A retrospective data analysis of records of all preterm babies screened for ROP between September 2017 to March 2018 was done. This include all preterm babies born in hospital and some were referred after birth from district and sub-district level hospitals to tertiary level care special newborn care unit in a government Medical College.

All babies were screened for Retinopathy of prematurity according to the guidelines of Rashtriya bal Swasthya Karyakram; Ministry of Health & Family Welfare- Government of India 2017.

1. First screening at 4 weeks of birth; Babies born before 36 weeks of birth and birth weight < 2000 gm.
2. Larger and term babies with risk factors like babies on cardio-respiratory support, hyperoxia, having respiratory distress syndrome, chronic lung disease, fetal hemorrhage, blood transfusion, neonatal sepsis, acidosis, exchange transfusion, Intraventricular hemorrhage, apnea, poor postnatal weight gain.
3. Infants with period of gestation less than 28 weeks or less than 1200 grams birth weight should be screened early at 2-3 weeks after delivery, and were followed up till retinal vascularization completes.

All preterm infants were initially screened at 4 weeks postnatally. Babies were examined by dilating the pupils with 0.5% tropicamide and 2.5% phenylephrine eye drops. An infantile eye speculum was used to keep the eye being examined open. All babies were examined by an ophthalmologist experienced in ROP using indirect ophthalmoscope with a +20D condensing lens and scleral depression. The severity and extent of ROP was recorded in the chart. The international classification of ROP was used to document all retinal examination findings.

ROP is categorized based on the severity of the disease into stages (0-5), location of the disease into 3 zones (Zone 1-3), extent of the disease based on clock hours (1-12) and the presence of plus disease.

The retina is divided into three concentric circles, each centered on the optic disc. The retinal vessels grow out from the optic disc to the periphery and the designation of zones corresponds to the vascular developmental pattern. (figure 1)

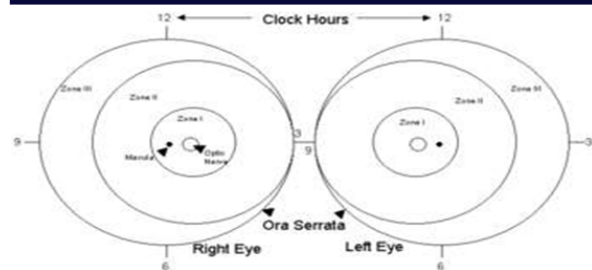


Figure 1

**Location**

- Zone I: posterior retina within a 60° circle centered on the optic nerve
- Zone II: from zone I to a 360° circle encompassing the nasal ora
- Zone III: remaining temporal peripheral retina

**Severity**

- Stage 1: a flat demarcation line that differentiates vascular from avascular retina
- Stage 2: elevated ridge between the vascular and avascular retina with or without small tufts of fibrovascular proliferation ("popcorn")
- Stage 3: neovascular vessels growing along the ridge into the vitreous
- Stage 4: partial retinal detachment
  - 4A: extrafoveal
  - 4B: including fovea
- Stage 5: total retinal detachment, usually with funnel configuration
- Plus disease: arteriolar tortuosity and venous engorgement in the posterior pole, a sign of progressive disease
- Preplus disease: dilation and tortuosity that are insufficient for the diagnosis of plus disease

**RESULT:**

Total 321 preterm babies were screened for retinopathy of prematurity (ROP) in a period of 6 months from September 2017 to March 2018 in special Newborn Care Units and in retina clinic of ophthalmology department.

Out of the studied 321 infants, 56 infants (17.44%) developed ROP in one or both eyes.

Among these 47 (14.64%) cases were in stage 1, three cases with stage 2, and two cases were progressed to stage 3. None of the studied neonates presented ROP at stages 4 or 5. Plus disease was seen in 4 eyes (1.2%). Low gestational age, sepsis, oxygen therapy, and frequent blood transfusions were significant risk factors for ROP.

**SUMMARY AND CONCLUSION**

This study conducted in a government tertiary care hospital and covers rural and urban population and highlights incidence of ROP in this region. The incidence of ROP in this study was 17.44% which was lower with reports from various other parts of India which documented an incidence between 20-51.9% (table 1). Neonatal care is highly variable in different parts of our country and there is a great divide in developed and less developed parts. Wide range of incidence in different studies was due to different screening criteria in each study. This low incidence in the current study may also be a result of small sample size and small duration of study. Low gestational age and lower birth weight were found to be significantly associated with severe ROP; this may direct us to follow universal guidelines for the management of infants with the risk of developing ROP and those with the established disease.

TABLE 1

S.NO	FIRST AUTHOR	SCREENING CRITERIA	n	INCIDENCE
1	Gopal L/1995	<2000gm	50	38%
2	Aggarwal R/2002	<35 wks <1500 gm	76	32%
3	Gupta VP/2004	<32wks	60	21.7%
4	Sharma P/2009	<1800gm <34wks	704	11.9%
5	Chaudhari S/2009	<1500gm	552	22.3%

Rashtriya BAL Swasthya Karyakram is a National Programme under NRHM aimed at improving the quality of life of children from Birth to 18 years through early screening and management of selected health

conditions. It is estimated that currently there are approximately 270,000 blind children in India. The major causes of blindness in children include cataract, Retinopathy of Prematurity (ROP), and Vitamin A deficiency. Approximately half of all the childhood blindness can be avoided or treated. The incidence of ROP is increasing in India due to improved neonatal care facilities. Fortunately, the disease course in ROP offers a unique opportunity to identify and treat the disease. Most premature babies at risk of developing the disease are already under the care of pediatrician, so one does not need to go into the community to screen for this disease.

One needs to organize a network among pediatrician, ophthalmologist, paramedical staff and parents, for early detection and effective treatment of ROP. It also provides a universal screening guideline to follow and with a proper screening and management strategy we could succeed in decreasing visual loss due to the retinopathy of prematurity.

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