

Screening and Result Analysis of Retinopathy of Prematurity in Preterm and Low Birth Weight Neonates

Payal Arora*, Nilesh V Parekh**

*Resident, **Head of Department, Department of Ophthalmology, Government Medical College, Bhavnagar (Gujarat) 364001.

Abstracts: Background and Objectives: A cross sectional study was carried out at Department of Ophthalmology, Sir Takhtsinhji Hospital and Government Medical College, Bhavnagar from November 2015 – May 2016 in 50 preterm and low birth weight neonates to screen them for retinopathy of prematurity. **Methods:** Subjects were neonates of low birth weight and/or premature, attending out patient department as well as indoor at Sir Takhtsinhji hospital. After anterior segment evaluation of both the eyes, pupils were dilated. Posterior segment evaluation done using binocular indirect ophthalmoscope and 28 D lens after applying pediatric eye speculum. Vascularization of retina was examined upto the periphery and charted. Data was entered in Microsoft Excel 2007 and Incidence rate calculated of ROP. **Results & Conclusion:** Incidence of retinopathy of prematurity in preterm and low birth weight neonates is 20%. Out of which, 60% neonates had birth weight ≤ 1000 g and 70% neonates had gestational age ≤ 28 weeks at the time of birth. So, screening of ROP is mandatory in all premature and low birth weight neonates. [Payal A NJIRM 2017; 8(2):166-168]

Key Words: Retinopathy of prematurity, low birth weight, gestational age.

Author for correspondence: Payal Arora, Department Of Ophthalmology, Government Medical College, Bhavnagar-364001 Gujarat E-Mail: payal.arora260291@gmail.com M: 7405873551

Introduction: Retina plays a major role in our vision as it is a neurosensory layer and sends signals to brain with the help of optic nerve. Any damage to retina or any part of it causes loss of vision.

Retinopathy of prematurity (ROP) is a vasoproliferative retinal disorder that occurs in the incompletely vascularised retina of primarily premature infants.

Incidence of which increases with decreasing birth weight and maturity of baby.

Hyperoxia was the reason which was assumed responsible for causation of the disease previously. But now low levels of vascular endothelial growth factor (VEGF) is considered major risk factor along with high levels of oxygen and nitric oxide³.

Screening of ROP is necessary as it can cause permanent blindness to the child, or can produce serious manifestations such as amblyopia, squint, high myopia, refractive errors, which may affect vision of the child.

This study was done to screen premature (≤ 37 weeks of gestation) and low birth weight (≤ 2000 g) neonates with the help of indirect ophthalmoscope for any signs of ROP. So if any signs found, further management can be done.

Methods: Data was collected after approval from

Institutional Review Board (IRB), Government Medical College, Bhavnagar.

Study Design: Cross sectional study.

Study Area: Sir Takhtsinhji hospital Bhavnagar.

Sample Size: Total 50 premature and low birth weight neonates.

Study Period: 6 months.

Inclusion Criteria:

1. Subjects whose parents are giving written and informed consent for examining their child.
2. New born of gestational age ≤ 34 weeks or birth weight ≤ 2000 g
3. Any baby of gestational age ≤ 37 weeks or birth weight ≤ 2000 g with any of following-Sepsis, Acute respiratory distress syndrome, Multiple blood transfusions, Multiple births, Oxygen support

Exclusion Criteria:

1. Parents who are not giving written and informed consent.
2. Subject having very poor general condition.
3. Subject having other congenital anomalies of eye or body.

Methods⁶: Detailed history was taken specially birth weight, gestational age, any complication during delivery. Both the eyes examined under torch light for any anterior chamber changes. After that both eyes dilated using diluted Tropicamide (0.4%) +

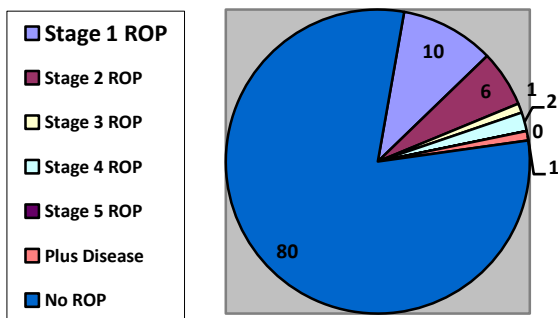
Phenylephrine (2.5%) eye drops . Drops were instilled three times 10 minutes apart in both eyes. While instilling mydriatic eye drop pulse monitor was attached to look for pulse and blood pressure of the child. Excess drops were immediately blotted to decrease systemic absorption and side effects.

Retina of both eyes examined one by one using sterile pediatric eye wire speculum after instilling 1 drop of topical anesthetic eye drop (paracaine (0.5%)). Wire scleral depressor [13,16] was used for peripheral retinal examination with the help of indirect ophthalmoscope and 28 D lens .

All the quadrants of both the eye examined and charted. Infants with normal vascularization of the fundus upto the periphery were not re-examined. Infants with ROP stage 1 examined at weekly interval until they resolve completely or progress. In other stages re examination was advised according to their zone involvement and stage of ROP.

Result: Total 50 subjects were included in the study who were either low birth weight or/and premature neonates. Out of 100 eyes 80 eyes had no signs of ROP and 20 eyes were diseased. Out of 20 diseased eyes, 10 eyes were diagnosed as stage 1 ROP (50%), 6 eyes as stage 2 ROP (30%), 1 eye as stage 3 ROP (5%) , 2 eyes as stage 4 ROP (10%), 0 as stage 5 and 1 eye as plus disease (5%) [Chart 1]

Chart 1- Incidence of ROP



In this study results were directly related to birth weight and gestational age of the neonates. Lesser the weight more the incidence and more maturity lesser incidence reported. [chart 2 and 3]

Chart 2: Percentage of ROP according to different birth weight (BW) group

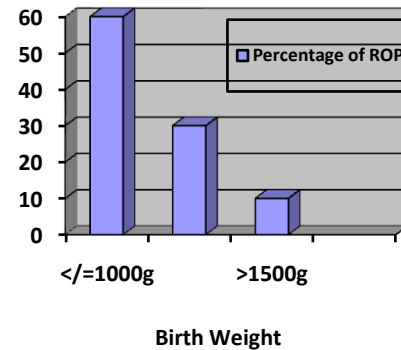
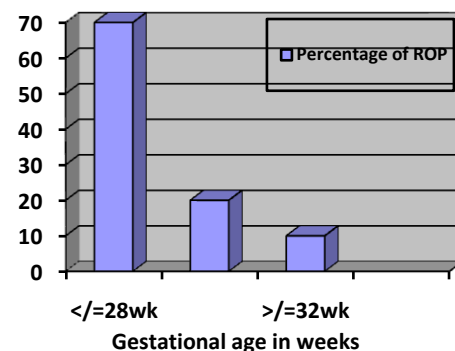


Chart 3: Percentage of ROP according to different Gestational Age (GA) at birth groups



In this study out of 20 eyes which were diagnosed as ROP 6 subjects were <=1000 g weight 3 were 1000-1500 g weight and 1 was of 1501-2000 g weight at the time of birth. Also, 7 subjects were <=28 wks of gestational age, 2 were 29-31wks of gestational age and 1 was >32 weeks of gestational age at the time of birth.

Discussion: Retinopathy of prematurity has not been reported as a serious challenge in India till now. With improving neonatal care and increasing survival of low and very low-birth weight children, the incidence is expected to increase exponentially in the near future. Routine evaluation of preterm infants at risk is not, as yet, being done due to lack of awareness of this potentially blinding problem. Hitherto, most cases were being referred to the ophthalmologist with stage 5 ROP at which stage prophylactic treatment cannot be offered and surgical treatment is successful only in a small number.

In view of the significantly different fundoscopic picture in the infants, ophthalmologists should become familiar with the appearance of normal retina of infants, to facilitate easy diagnosis of ROP. No

anaesthesia is required or desirable for routine screening of the infants.

Since these infants do not move their eyes much, stabilizing the head alone allows adequate examination. Use of binocular indirect ophthalmoscope is a necessity and Scleral depression with the help of wire vectis indicated to visualize the extreme periphery. The depressor is used over topically anaesthetised conjunctiva .

As by doing this screening test only we can identify the disease early and timely interventions can be done. This screening procedure just require awareness of treating doctors and ophthalmologists and indirect ophthalmoscopy (which is routinely practiced now a days by ophthalmologists).

The present study has shown the incidence rate of 20% of ROP in a sample of 50 neonates. Positive results are more with very low birth weight as well as less gestational age. Results are comparable with study done by Subhadra Jalali et al in 2014 which shows 22% incidence rate of ROP⁹. Our results are lesser than the other study conducted by Gopal Lingam et al which shows 38% incidence rate¹⁰.

Limitation of our study is duration of the study and awareness among parents about ROP. As in India previous studies which had been conducted were of around 5 year or 10 year duration, those studies also shows the results of long term complications of diagnosed and treated ROP cases. Lack of awareness causes drop out from follow up examination of neonates which may lead to progression of stage 1 to 2 and more.

Conclusion: On the basis of our present study we can conclude that, retinopathy of prematurity is a major cause of preventable blindness in children. We should pay attention on this and screening should be must for each and every premature and low birth weight neonate for timely intervention and prevention of blindness or ocular morbidity.

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