TO ASSESS OCULAR FUNDUS MANIFESTATIONS IN NEWBORNS SCREENED FOR RETINOPATHY OF PREMATURITY AT TERTIARY CARE CENTRE, TELANGANA, INDIA

ABSTRACT

Aim
ROP is a complication in premature babies with immature retina which leads to blindness and is preventable with timely action and intervention. The aim is to Assess OculoFundus Manifestations In Newborns Screened For ROP.

Material and methods
This study is a hospital based interventional study conducted at Gandhi Hospital, Secunderabad. Out of 1133 preterm babies admitted in NICU, 399 new born infants were screened for ROP between Jan 17 to March 18. Of which 36(9%) babies had mature retina and 358(91%) had immature retina. The incidence of ROP is 32%.

Conclusion
Since ROP may produce complete blindness, effective screening and meticulous long term followup is necessary to prevent blindness and long term complications of ROP like myopia, squint, cortical brain damage.

In most of the cases it does not require treatment but close followup.

AIM & OBJECTIVE
Retinopathy of prematurity is a complication in premature babies with immature retina which can lead to blindness and is preventable with timely action and intervention. The aim of the study is to Assess OculoFundus Manifestations In Newborns Screened For ROP.

INTRODUCTION
ROP defined as a progressive abnormal neovascular development in the retina of premature infants with immature retina of low birth weight resulting in blindness and visual impairment.1 These abnormal blood vessels are fragile and can leak or bleed, scarring the retina and pulling it out of position. This causes a tractional retinal detachment, which is the main cause of visual impairment and blindness in ROP.19 Developing countries show rise in ROP.18

Screening is done according to American Academy of Pediatrics guidelines.35

METHOD
The study is a hospital based interventional study, on preterm babies admitted in Neonatal ICU in Gandhi hospital, Secunderabad.

Screening is done in neonatal unit by a neonatologist and diagnosis of ROP done by ophthalmologist, after instillation of proparacaine 0.5% drops, a wire speculum is placed and examined using indirect ophthalmoscope, scleral indenter, infantile speculum & neonatal scleral depressor.

The study was done on 399 neonatal babies from JAN 17-MARCH 18. Exclusion criteria is Infants who underwent ROP screening at other hospitals.

The incidence of ROP is increasing in India due to improved neonatal facilities. The course gives possibility for the physician to identify and treat the disease.16

Oxygen is important cause in development of ROP, studies9 stated that anoxia causes retinal vessels to dilate initially, then leading to edema, transudation and haemorrhages.10, when normal foetus is in a state of cyanosis, even normal concentration of oxygen is toxic to immature tissues. Anoxia might occur at the cellular level during oxygen therapy; “hypoxic-anoxia” occur as a result of inactivation of oxidative enzymes from exposure to high oxygen levels.

In primary stage (vasoconstrictive phase) the normal vasculogenesis of the retina is disturbed by the relative hypoxia of the extraterine environment.11 This causes vaso-obliteration and non-vascularization of some areas of the anterior retina.12 The subsequent hypoxia causes a second chronic phase, by the proliferation of vascular and glial cells, arteriovenous shunt formation, leading to cicatrical changes and visual impairment.13,14

Early identification of retinal damage and the institution of appropriate treatment prevent blindness and better overall development.18 Screening is done according to American Academy of Pediatrics guidelines.35

Out of approximately 50 million blinds in the world, 4% (2 million) are children. India shares 20% of the world childhood blindness; ROP is one of the important causes of childhood blindness in India. Out of 100 preterm infants, 20-40 develop ROP, of which 3-7 can progress to blindness.34

Classification of ROP was done based on location and severity, and on presence/absence of plus disease.16

<table>
<thead>
<tr>
<th>Location</th>
<th>Fig1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Presence of a thin white demarcation line, separating vascular from avascular retina</td>
</tr>
</tbody>
</table>

Table 1: Classification of ROP

A. Location

B. Severity

Dr. B. Kantha Sree
MS Associate Professor and HOD Dept. of Ophthalmology, Gandhi Medical College, Gandhi Hospital, Secunderabad, Telangana

Dr. V. E. Raju
MS Assistant Professor Dept. of Ophthalmology, Gandhi Medical College, Gandhi Hospital, Secunderabad, Telangana. *Corresponding Author

Dr. Shubham Lakshman Gaddalay
House Surgeon Gandhi Medical College, Gandhi Hospital, Secunderabad, Telangana

Dr. Saumya Lakshman Gaddalay
House Surgeon Gandhi Hospital, Secunderabad, Mallareddy Medical College For Women, Hyderabad

KEYWORDS: ROP, Oculofundus manifestation, screening and followup
Follow-up schedule for ROP screening 15

<table>
<thead>
<tr>
<th>Follow-up</th>
<th>Indications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 week or less</td>
<td>Immature vascularization, zone I– no ROP</td>
</tr>
<tr>
<td>1-2 weeks</td>
<td>Immature vascularization, zone II</td>
</tr>
<tr>
<td>2 weeks</td>
<td>Stage 1 ROP, no plus disease, zone II– no ROP, regressing ROP</td>
</tr>
<tr>
<td>2-3 weeks</td>
<td>Stage 1 or 2 ROP, no plus disease, zone III– no ROP, regressing ROP</td>
</tr>
<tr>
<td>Stop screening</td>
<td>Full retinal vascularization, regression of ROP</td>
</tr>
</tbody>
</table>

Long term follow up is required because infants with ROP have an increased risk of high degrees of myopia, squint, cortical brain damage. Regular follow up is required for detection and management. 27

Management done accordingly

a) Stages 1 & 2 Observation with follow up
b) Stage 3 Laser photoagulation
 c) Stage 4 & 5 Vitrectomy 20

RESULTS

Out of 1133 preterm babies admitted in NICU, 399 new born infants were screened for ROP according to AAP guidelines between Jan 17 to March 18. Of which 36 (9%) babies had mature retina which did not require follow up and 358 (91%) had immature retina which require follow up. ROP is a serious complication of immature retina. And Zone 1–13 (4%) of babies, Zone 2–114 (31.4%), Zone 3– 171 (47.1%), Stage I–24 (6.6%), Stage II–3 (0.8%), Stage III–1 (0.2%), plus diseases–3 (0.8%), Regressive ROP–13 (4%). The incidence of ROP is 32%.

5 cases were not included due to missing data.

DISCUSSION

ROP is avoidable cause of childhood blindness and its control is given priority in “WHO Vision 2020” programme. In our study Out of 1133 new born premature infants admitted in NICU, 399 were screened, mature retina is 9% (36) which do not require follow up, and 91% (358) had immature retina which required regular follow up and management.

Incidence of ROP in the study conducted in Shimla was 16% i.e. 8 of the 50 neonates had ROP. Various Indian and International studies reported overall incidence 17.5% to 51.9% and 10.0% to 45.4% respectively. 21, 22, 23 A study by Patil et al on 40 babies < 32 weeks or <1250 grams had incidence of ROP 17.5% and no severe ROP, while other studies on babies <35 weeks or <1500 grams have incidence of 20% and severe ROP of 7%. 24

Incidence of ROP

<table>
<thead>
<tr>
<th>Total no.</th>
<th>% of ROP</th>
<th>Stages %</th>
<th>% of plus disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palmer et al 28</td>
<td>4099</td>
<td>65.8</td>
<td>25.2</td>
</tr>
<tr>
<td>Fielder 29</td>
<td>572</td>
<td>50.9</td>
<td>29.9</td>
</tr>
<tr>
<td>Rohit Charan et al 33</td>
<td>165</td>
<td>47.2</td>
<td>16.9</td>
</tr>
<tr>
<td>Holmstrom 31</td>
<td>236</td>
<td>40.4</td>
<td>9.2</td>
</tr>
<tr>
<td>Acheson &amp; Schuenburg 30</td>
<td>304</td>
<td>32.6</td>
<td>10.5</td>
</tr>
<tr>
<td>Darlow 32</td>
<td>313</td>
<td>21.0</td>
<td>10.9</td>
</tr>
<tr>
<td>Our Study</td>
<td>1133</td>
<td>32</td>
<td>6.6</td>
</tr>
</tbody>
</table>

NS = Not Specific

It is not possible to compare studies, as the inclusion criteria that are considered are various.

In our study we observed, on follow up babies with immature retinas with criteria of B.wt > 1500 gms the percentage of immature retinas decreased from 87.3% to 58.6% and percentage of mature retinas increased from 12% to 38.8%. The zones percentage decreased as Zone 1 from 1% to 0, Zone 2 from 45% to 12%, Zone 3 from 67% to 37.4%, and percentage of Stage I, II & plus disease increased to 8.8%, 0.7% & 1.8%. Thus suggesting progression of disease.

Intervention in the newborn infants was done for 6 cases.

Hence, meticulous fundus examination is essential for early detection and timely prevention in all preterm babies is essential for early detection of ROP and its progression. 25, 26

CONCLUSION

Since ROP may produce complete blindness, effective screening and meticulous long term follow up is necessary to prevent blindness and long term complications of ROP like myopia, squint, cortical brain damage.
In most of the cases it does not require treatment but close followup and timely intervention of risk factor reduces progression to visual impairment.

REFERENCES


26) The International Agency for the Prevention of Blindness, With inputs from Prof Clare Gilbert; ICGE.

