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Original Research Paper

Ophthalmology

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

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

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 Fundus 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.

KEYWORDS : ROP,Oculofundus manifestation,screening and 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.19Developing countries show rise in ROP prevalence as the "third epidemic" due to the higher premature births,improving medical services,decreased access to neonatal resources.2,3The main risk factors for developing ROP in premature infants, are gestational age and birth weight.4,5 Other risk factors in ROP development includes artificial ventilation,sepsis,necrotizing enterocolitis, postnatal glucocorticoids,and cardiopathy.[6,7,8]

Oxygen is important cause in development of ROP, studies9 stated that anoxia causes retinal vessels to dilate initially,then leading to edema, transudation and haemorrhages10,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 hyperoxia of the extrauterine environment.11 This causes vaso-obliteration and non-vascularization of some areas of the anterior retina.12The subsequent hypoxia causes a second chronic phase,by the proliferation of vascular and glial cells, arteriovenous shunt formation,leading to cicatricial changes and visual impairment.[13,14]

Early identification of retinal damage and the institution of appropriate treatment prevent blindness and better overall development.18Screening is done according to American Academy of Pediatrics guidelines[15]

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 blindness34.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

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 neonatalogist and diagnosis of ROP done by ophthalmologist ,after instillation of proparacaine and dilatation with tropicaminde 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

Classification of ROP was done based on location and severity,and on presence/absence of pre-plus/plus disease16

Table 1: Classification of ROP

A. Location		Fig1
B. Severity		
	Stage 1	Presence of a thin white demarcation line, separating vascular from avascular retina

	Stage 2	Prominent line, having height and width
	Stage 3	Extra-retinal fibrovascular proliferation with abnormal vessels and fibrous tissue from the ridge and extending into vitreous
	Stage 4	Partial retinal detachment; not involving macula (4A) or involving macula (4B)
	Stage 5	Complete retinal detachment Plus disease Presence of dilated and tortoise posterior retinal vessels. Associated vitreous haze, pupillary rigidity.
Pre-plus disease		Vascular abnormalities of posterior pole, insufficient for diagnosis of plus disease but more than what is considered normal
Plus disease		Presence of dilated and tortoise posterior retinal vessels. Associated vitreous haze, pupillary rigidity

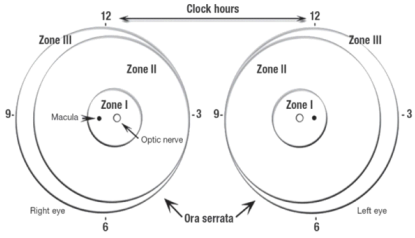


Fig1
Retina of the right and left eye,showing borders of the 3 zones and clock hours used to for location and extent of ROP17

Follow-up schedule for ROP screening15

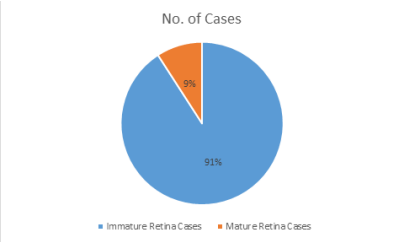
Follow-up	Indications
1 week or less	Immature vascularization,zone I–no ROP Immature retina extends zone II
1-2 weeks	Immature vascularization,zone II Stage 2 ROP,no plus disease
2 weeks	Stage 1 ROP,no plus disease,zone II zone II–no ROP,regressing ROP
2-3 weeks	Stage 1 or 2 ROP,no plus disease,zone III Regressing ROP
Stop screening	Full retinal vascularization.Regression of ROP

Long term followup is required because Infants with ROP have a 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 photocoagulation
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 followup .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 retinas is 9%(36)which donot require followup,and 91%(358)had immature retinas which required regular followup and management.

Incidence of ROP in the study conducted in shimla was 16% i.e.8 of the 50 neonates had ROP20Various Indian and International studies reported overall incidence 17.5% to 51.9% and 10.0% to 45.4% respectively21,22,23A study by Patil et al on 40 babies <32week or <1250grams had incidence of ROP 17.5% and no severe ROP, while other studies on babies <35week or <1500grams have incidence of 20% and severe ROP of 7%.24

Incidence of ROP

	Total no.	% of ROP	Stages %				% of plus disease
			1	2	3	4	
Palmer et.al28	4099	65.8	25.2	21.7	18.3	0	11
Fielder29	572	50.9	29.9	16.3	4.4	0.3	4.7
Rohit Charan et.al33	165	47.2	16.9	17.6	11.5	1.2	10.3
Holmstrom31	236	40.4	9.2	11.2	17.3	2.3	NS
Acheson & Schuenburg30	304	32.6	10.5	10.8	11.5	0	NS
Darlow32	313	21.0	10.9	7.6	1.9	1.9	NS
Our Study	1133	32	6.6	0.8	0.2	0	0.8

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 followup babies with immature retinas with criteria of B.wt>1500gms the percentage of immature retinas decreased from 87.3%to 58.6% and percentage of Mature retinas increased from 12%to38.8%.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 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 and timely intervention of risk factor reduces progression to visual impairment.

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