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Original Research Paper

Ophthalomology

"A STUDY OF RISK FACTORS ASSOCIATED WITH RETINOPATHY OF PREMATURITY IN PREMATURE BABIES IN TERTIARY CARE CENTRE"

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ABSTRACT

Introduction: Retinopathy of prematurity which is also known as retrolental fibroplasia or terry's syndrome, is a disease of the eye that affects prematurely born babies and occurs usually after receiving the intensive neonatal care, in which oxygen therapy is given to treat the premature development of their lungs .It is thought to be caused by disorganised or abnormal growth of retinal blood vessels which may result in scarring and retinal detachment. **Method:** A descriptive observational study was conducted on 417 premature babies weighing < 1750 gms and 34 weeks in a tertiary care centre from November 2018 to October 2020. Ethical committee approval was taken.Informed consent was taken from the mothers of the babies included in inclusion criteria. All the necessary history was taken and appropriate screening of the premature babies for fundus examination was done as long as the babies were present in the neonatal ICU and for other babies, mothers were counseled to follow up at required dates for further assessment. **Results:** Total of 417 newborns were included in this study, among them 72 developed ROP. The overall incidence of ROP was found to be 17.26%. Lesser gestational age, lower birth weight, RDS, oxygen therapy,and apnea, were the significant risk factors associated with Retinopathy of prematurity. There are certain risk factors in premature babies such as RDS,O2 therapy,Blood transfusion(to some extent) as well as certain risk factors in mother which can lead to retinopathy of prematurity. So it is very important to screen the premature babies for early detection and timely management of ROP.

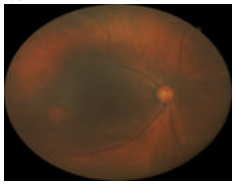
KEYWORDS : KeywordsRetinopathy of prematurity, Premature babies, Risk factors, Retrolental fibroplasia, Oxygen supplementation, Lower gestational age, Low birth weight, Classification of ROP

INTRODUCTION: 1.

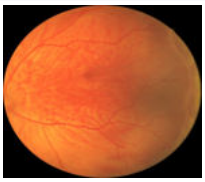
In 1942, Terry found out about this disorder and termed it as "Retrolental fibroplasia". Initially it was thought to be because of oxygen exposure. So, with restricted oxygen use, the incidence of ROP decreased. The natural course of ROP is either it may resolve spontaneously or with appopriate treatment, or it may cause mild myopia to total retinal detachment.The enigmatic findings of the disease, with scar tissue behind the neonate lens associated with retinal detachment, have been responsible for the two largest "epidemics" of blindness in neonates in modern times.Out of 26 million annual births in India, approximately 2 million babies are < 2000 g in weight and are at risk of developing retinopathy of prematurity (ROP). In India, the incidence of ROP is between 38% and 51.9% in low-birth-weight babies. International committee for classification of retinopathy of prematurity has classified ROP based on location , extent and stages. Early detection and treatment of retinopathy of prematurity decreases the incidence of ocular morbidity and further complications caused by it.7.

Classification:

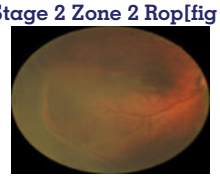
The process of the disease is classified into five stages. Stage I -Is characterized by a demarcation line separating vascularised and avascular retina within the retinal plane. Stage II -Is characterized by ridge which is an enlargement of demarcation line extending up and out of retinal plane.Stage III -Is characterized by a ridge and development of extra retinal fibrovascular tissue. Stage IV -Is characterised by subtotal retinal detachment caused because of traction from the proliferating tissue in the vitreous or the retina.Stage IVa : Subtotal retinal detachment not involving macula Stage IVb: Subtotal retinal detachment involving Macula .Stage V :Total Retinal Detachment .



Normal Fundus[fig 1]



Stage 2 Zone 2 Rop[fig 2]



Stage 2 Zone 2 Double Ridge[fig3]

Intraretinal Haemorrhage [fig4]

Stage 5 Rop[retinal Detachement][fig5]

MATERIALS AND METHODS:

A descriptive observational study was conducted on 417 premature babies weighing < 1750 gms and 34 weeks in a tertiary care centre from November 2018 to October 2020.Ethical committee approval was taken.Informed consent was taken from the mothers of the babies included in inclusion criteria.All the necessary history was taken and appropriate screening of the premature babies for fundus examination

was done as long as the babies were present in the neonatal ICU and for other babies, mothers were counseled to follow up at required dates for further assessment.

Inclusion Criteria:

1. All preterm babies less than or equal to 34 weeks of gestation born in a tertiary health care centre.
2. All the babies of birth weight equal to or less than 1750 gms.
3. All the babies of the mothers who have been advised by the paediatrician to get screened for retinopathy of prematurity.

EXCLUSION CRITERIA:

1.All the babies more than 34 weeks of gestational age. 2.All the babies weighing more than 1750gms.3.Babies with major congenital anomalies.4.Babies with any suspected chromosomal aberrations.

Study Instruments:

1. Indirect opthalmoscope with 20d lens,topical anaesthetic agent, infant eye speculum.2.dialating drops, [cyclopentolate 0.5% and 2.5% phenylephrine} antibiotic drops [tobramycin 0.3%] post evaluation.3. fundus camera. [3 netra] 4.discharge card of the baby mentioning number of visits for the fundus examination.

FIG 6[20 DIOPTRE LENS]

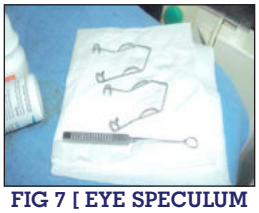


FIG 7 [EYE SPECULUM WITH SCLERAL INDENTOR]

Examination Of The Baby With Indirect Ophthalmoscope And 20d Lens.

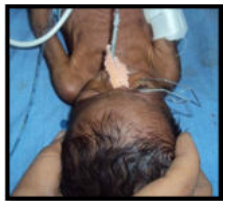


Figure 8 Examination 1

Fig 9 Examination 2

Figure 10 Topical Anaesthetic Agent

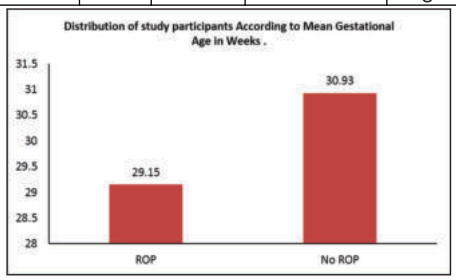
Figure 11 Indirect Ophthalmoscope

RESULTS AND OBSERVATIONS:

Total 417 Pre-term babies were studied and 72 developed ROP so the frequency of ROP in our study was 17.26%Chi square test was used for comparing proportions and t test was used for comparing means.Analysis was performed on prism 8.0 version.

Table 1Distribution of study participants According to Mean Gestational Age in Weeks

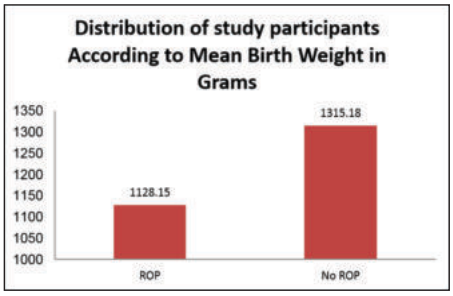
Variable	ROP	No ROP	Unpaired t value with Df	p Value
Mean Gestational Age in Weeks	29.15 ± 2.01	30.93 ± 2.04	6.72, 415	P<0.0001 Highly Significant



Graph 1Distribution of study participants According to Mean Gestational Age in Weeks

Table 2 Distribution of study participants According to Mean Birth Weight

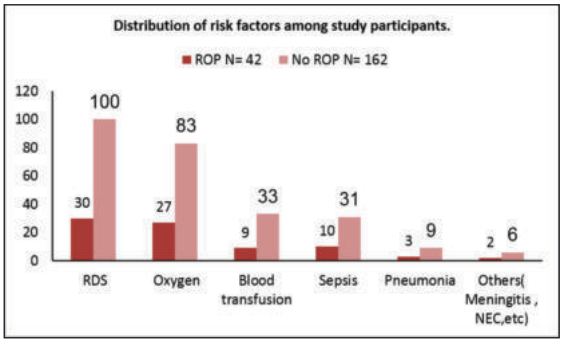
Variable	ROP	No ROP	Unpaired t value with df	p Value
Mean Birth Weight in Grams	1128.15 ± 231.25	1315.18 ± 206.54	6.84 ,415	P<0.0001 Highly Significant



Graph2 Distribution of study participants According to Mean Birth Weight in Grams

Table 3 Distribution of risk factors among study participants.

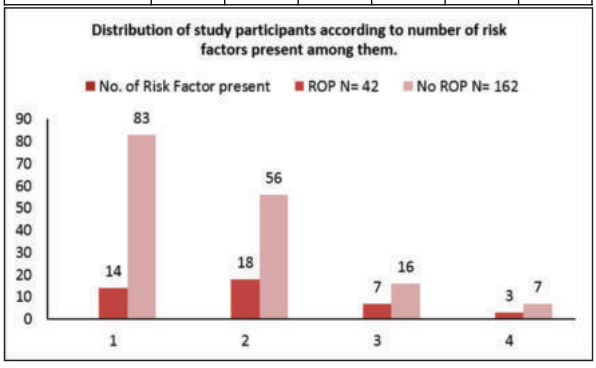
Risk Factor	ROP N= 42		No ROP N= 162		Total	
RDS	30	71.42%	100	61.72%	130	63.72%
Oxygen	27	64.28%	83	51.23%	110	53.92%
Blood transfusion	9	21.42%	33	20.37%	42	20.58%
Sepsis	10	23.80%	31	19.13%	41	20.09%
Pneumonia	3	7.14%	9	5.55%	12	5.88%
Others(Meningitis , NEC,etc)	2	4.76%	6	3.70%	8	3.92%



Graph 3 Distribution of risk factors among study participants

Table 4 Distribution of study participants according to number of risk factors present among them.

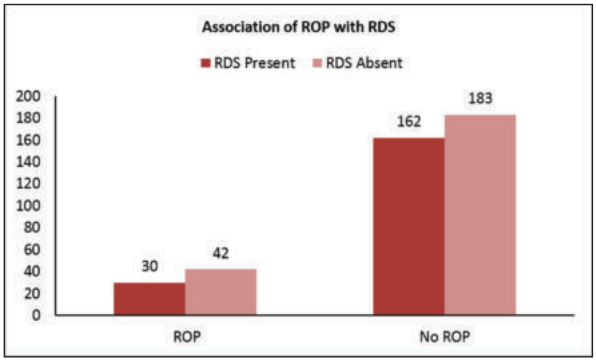
No. of Risk Factor present	ROP N= 42		No ROP N= 162		Total	
1	14	33.33%	83	51.23%	97	47.54%
2	18	42.83%	56	34.56%	74	36.27%
3	7	16.66%	16	9.87%	23	11.27%
4	3	7.14%	7	4.32%	10	4.90%



Graph 4 Distribution of study participants according to number of risk factors present among them

Table 5 Association of ROP with RDS

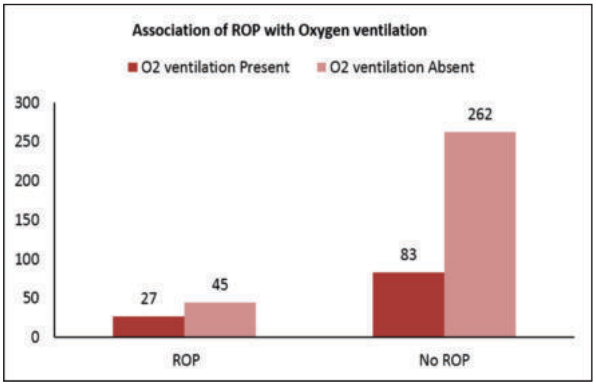
Risk factor	ROP		No ROP		χ 2 with df	p Value
RDS Present	30	41.66%	162	46.95%	3.89, 1	0.0485 Significant
RDS Absent	42	58.33%	183	53.04%		
Total	72		345			



Graph 5 Association of ROP with RDS

Table 6 Association of ROP with Oxygen ventilation

Risk Factor	ROP		No ROP		$_{x}$2 with Df	p Value
O2 ventilation Present	27	37.5%	83	24.05%	4.87, 1	0.02 Significant
O2 ventilation Absent	45	62.5%	262	75.94%		
Total	72		345			



Graph 6 Association of ROP with Oxygen ventilation

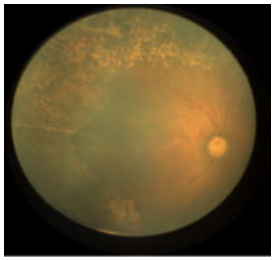


Fig 12 Regressed Rop Post Laser Treatment

DISCUSSION:

ROP is classified according to ICROP (international classification of ROP).The current classification of ROP describes the location, extent and severity of the disease and divides the Retina into three concentric Zones around the optic disc. Zone I -The posterior or the inner zone is marked upto the extent of twice as the disc macular distance (or) 30 degree in all directions from the optic disc. Zone II -It middle zone is marked from the outer edge of zone I to the ora serrata nasally and to the anatomic equator temporally. Zone III -The outer zone is marked by the residual crescent that extends from the outer border of zone II to the ora serrata on the temporal side. The extent of involvement is marked by the number of circumferential clock hours involved.The process of maturation of retina is usually completed few weeks before delivery. But in premature babies it is incomplete or immature.So, if the vessels in the retina grow normally, retinopathy doesn't develop. Retinopathy of prematurity (ROP) or retrolental fibroplasia is a vascular disorder of the immature.

CONCLUSION:

The incidence of ROP in this study was 17.26% for any stage.92.68% were in stage 1 or 2 of the disease. This shows a decreased trend of the disease progression to higher stages , stage 3 or above. Most of the cases resolvedspontaneously. The incidence of ROP showed a significant statistical correlation with prematurity. A statistically significant correlation between birth weight and ROP was also shown in this study . Our study showed a greater risk of developing ROP with birth weights less than 1500 gms.There existed a statistically significant correlation between ROP and supplemental oxygen.Also,there was a statistically significant correlation between RDS and ROP. This indicates that patients with RDS are at increased risk of developing ROP. So, in brief present study shows, there are certain risk factors in premature babies such as RDS,O2 therapy,Blood transfusion(to some extent) as well as certain risk factors in mother which can lead to retinopathy of prematurity. So it is very important to screen the premature babies for early detection and timely management of ROP.The rate of ROP in moderately premature infants has decreased dramatically because of better care in the neonatal intensive care worldwide. However, this has led to high chances of survival of premature infants who would have had little chance of survival in the past. As these premature infants are at the highest risk of developing ROP the condition may be becoming more common again .

REFERENCES

1. McGregor ML, Bremer DL, Cole C, McClead RE, Phelps DL, Fellows RR, Oden N; HOPE-ROP Multicenter Group. High Oxygen Percentage in Retinopathy of Prematurity study. Retinopathy of prematurity outcome in infants with prethreshold retinopathy of prematurity and oxygen saturation >94% in room air: the high oxygen percentage in retinopathy of prematurity study. Pediatrics 2002 Sep; 110(3):540-4.
2. Ashton N. Pathological basis of retrolental fibroplasia. Br J Ophthalmol. 1954 Jul; 38(7):385–396.
3. Ashton N.: Retinal angiogenesis in the human embryo. Br Med Bull. 1970; 26:103-106.
4. F L Kretzer and H M Hittner. Retinopathy of prematurity: clinical implications of retinal development. Arch Dis Child. 1988 October; 63(10 Spec No): 1151–1167.
5. Keshet E.Preventing pathological regression of blood vessels. J Clin Invest. 2003 Jul; 112(1):27-9