



HOSPITAL BASED STUDY ON OCCURRENCE AND RISK FACTORS OF RETINOPATHY OF PREMATURITY

Dr. Kabita Bora Baishya

Associate Professor, Regional Institute of Ophthalmology, Gauhati Medical College and Hospital, Guwahati, Assam, India

Dr. Dhriti Talukdar

Post Graduate Trainee, Regional Institute of Ophthalmology, Gauhati Medical College and Hospital, Guwahati, Assam, India

ABSTRACT Retinopathy of prematurity, previously known as retrolental fibroplasia is a vasoproliferative disease that affects premature infants. Premature retina when exposed to high oxygen concentration, followed by abrupt withdrawal, easily undergoes uncontrolled vasculo fibrotic proliferation and eventually results in retinal detachment.

AIM: 1. To determine the incidence of ROP in neonates of gestational age less than 34 completed weeks; weighing less than 2000g 2. To determine its association with various clinical risk factors.

MATERIALS AND METHODS: This hospital based, prospective study was done in Regional Institute of Ophthalmology, Guwahati Medical College and Hospital. A total of 168 eyes of 84 babies were evaluated and the results were statistically analysed. The period of study was from June 2020 to May 2021. The results were statistically analysed using fisher's exact test or chi square test for independence.

RESULTS: In a total of 84 babies (168 eyes) the incidence of ROP was found to be 14.28%. The risk factors which had significant association with ROP in this study are: Prematurity, low birth weight, supplemental oxygen, respiratory distress syndrome. In addition, however, risk factors like gestational diabetes, phototherapy and sepsis also show significant association with ROP.

KEYWORDS : ROP, Oxygen supplementation, Prematurity, respiratory distress syndrome

INTRODUCTION

Retinopathy of prematurity is a vasoproliferative disease that affects premature infants in which there is abnormal proliferation of the developing blood vessels at the junction of the vascular and peripheral avascular retina. It is a leading cause of avoidable childhood blindness worldwide.

Unmonitored supplemental oxygen in NICU as well as increase in survival of premature babies due to advancements in neonatology have been attributed as the main causes of increased cases of ROP in the world.

Staging Of The Disease:

Stage 1: Demarcation Line: a flat white line within the plane of retina at the junction of the vascular and avascular retina.

Stage 2: ridge at the junction of the vascular and avascular retina.

Stage 3: external fibrovascular proliferation

Stage 4: subtotal retinal detachment

Stage 5: total retinal detachment

MATERIALS AND METHODS

The present study was done in RIO, Guwahati Medical College and Hospital. Screening was done as per Indian guidelines. A total of 168 eyes of 84 babies were evaluated and the results were statistically analysed. The period of study was from June 2020 to May 2021. Ethical clearance was obtained from the hospital ethics committee and informed consent of the parents was also taken.

Inclusion Criteria:

1. All neonates with birth weight <2000 grams
2. All neonates with gestational age <34 weeks
3. All infants born at more than 34 weeks gestational age with associated risk factors like prolonged oxygen requirement; respiratory distress syndrome, sepsis, phototherapy

Pupils were dilated using tropicamide 0.4% and 1.25% phenylephrine thrice or more at an interval of 15 minutes till complete mydriasis and examined by indirect ophthalmoscope.

The risk factors were statistically analysed using fisher's exact test or chi square test for independence. The p value <0.05 was considered statistically significant.

RESULTS

Out of 84 babies screened, 12 babies developed ROP in both eyes, making the incidence 14.3%

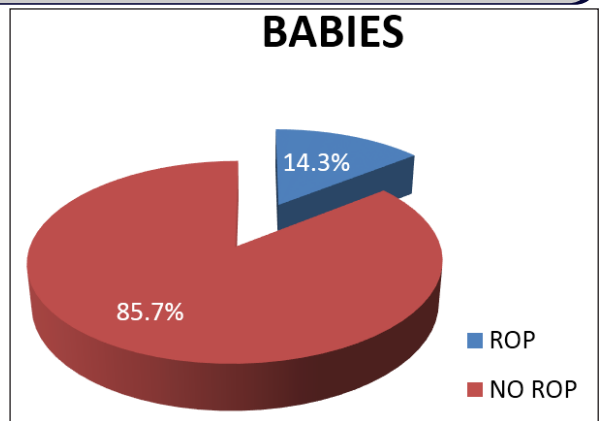


Fig1: Pie Chart Showing Incidence Of Rop

During the course of study, 12 cases of ROP were found, i.e. 24 eyes were found to be having ROP

The mean birth weight of all babies who were screened was found to be 1390 grams and that of babies who developed ROP in this study was found to be 1170 grams.

Gestational Age

The mean gestational age in this study was found to be 30.03 weeks. The p value of gestational age was found to be 0.0065 which is highly significant.

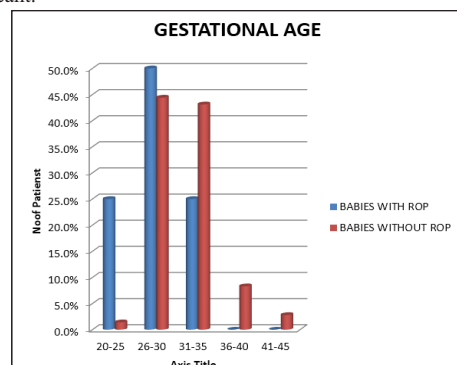


Fig 2: Diagram Showing Distribution Of Gestational Age In Babies With Rop

Oxygen Supplementation**Table 1: Distribution Of Oxygen Supplementation Among Screened Babies**

O2 SUPPLEMENTATION	TOTAL BABIES	ROP BABIES	PERCENTAGE
GIVEN	48	11	22.91
NOT GIVEN	36	1	2.7

The two sided P value is 0.0090, considered very significant

Respiratory Distress Syndrome(RDS)**Table 2: Distribution Of Rds Among Screened Babies**

RDS	TOTAL BABIES	NUMBER	PERCENTAGE
PRESENT	33	9	27.27
ABSENT	51	3	5.88

The two sided P value is 0.0062, considered very significant

Relative risk ratio is 4.63

Hyperbilirubinemia**Table 3: Distribution Of Hyperbilirubinemia In The Screened Babies**

HYPERBILIRUBINAEMIA	TOTAL BABIES	ROP BABIES	PERCENT AGE
PRESENT	34	8	23.52
ABSENT	50	4	8

The two sided P value is 0.045, considered marginally significant

Phototherapy**Table 4: Distribution Of Phototherapy Among Screened Babies**

PHOTOTHERAPY	TOTAL BABIES	ROP BABIES	PERCENTAGE
GIVEN	32	8	25
NOT GIVEN	52	4	7.69

The two sided P value is 0.0277, considered very significant

Gestational Diabetes**Table 5: Distribution Of GDM In Mothers**

GESTATIONAL DIABETES	TOTAL BABIES	ROP BABIES	PERCENTAGE
PRESENT	12	4	33.33
ABSENT	72	8	11.11

PVALUE- 0.0417, considered marginally significant

Neonatal Sepsis**Table 6: Distribution Of Neonatal Sepsis Among Screened Babies**

SEPSIS	TOTAL BABIES	ROP BABIES	PERCENTAGE
PRESENT	30	7	23.33
ABSENT	54	5	9.25

The two sided P VALUE is 0.077, considered marginally significant.

RELATIVE RISK ratio is 2.52

DISCUSSION

In our study, 84 babies fulfilling the inclusion and exclusion criteria were examined.

Incidence Of ROP

In the current study, in a total 84 babies(168 eyes) the incidence of ROP was found to be 14.28%

In England, a dataset derived from the National Health Service (NHS) database revealed that 12.6% of babies with birth weight (BW) less than 1500 g had ROP in 2011¹. This is similar to the finding of our study.

In a study by Dwivedi et al² in Madhya Pradesh between 2012-18, the incidence of ROP was found to be 14.2%, which resembles our present study.

Gestational Age And Birth Weight are the two strongest known risk factors for development of ROP. The mean birth weight of all babies who were screened was found to be 1390 grams and that of babies who developed ROP in this study was found to be 1170 grams. The mean gestational age in this study was found to be 30.03 weeks. The p value of gestational age was found to be 0.0065 which is highly significant.

The CRYO-ROP study found that lower birth weight and younger

gestational age were strongly associated with developing "threshold" ROP³

The risk factors which had significant association with ROP in this study are:

- **Oxygen Supplementation:**

In the present study, oxygen supplementation was found to be a very significant risk factor with p value 0.009 and relative risk factor is 2.54. Pioneering works of Campbell and Ashton explored the role of oxygen in the pathogenesis of a disease of the developing vasculature, retinopathy of prematurity⁴

- **Respiratory Distress Syndrome(RDS)**

In the present study, RDS has been found to have a very significant association with ROP with p value of 0.0062. A study by Park et al⁵ in South Korea found RDS to be a significant risk factor for ROP with p value 0.008, which resembles our study

- **Phototherapy**

The present study has found phototherapy to have a significant association with ROP (p value 0.062)

- **Sepsis**

The present study finds sepsis to be a marginally significant risk factor in ROP (p value 0.06).

- **Gestational diabetes mellitus(GDM)**

In the present study gestational diabetes is found to be a significant risk factor with p value 0.04.

- **Fetal distress**

The present study found fetal distress to be only a marginally significant risk factor for ROP. Not many studies have found fetal distress to be a very significant risk factor.

CONCLUSION

The occurrence of Retinopathy of Prematurity in RIO, GMCH in present study (14.28%) is comparable to few studies done worldwide and in India. However, it is slightly lower than few recent studies in India, the reason being smaller sample size due to the prevailing covid 19 pandemic at the time of study.

The mean birth weight of all screened babies was 1390 grams and mean POG was 30.06 weeks which is comparable to other studies.

Significance of risk factors for development of ROP in present study are comparable to other studies, the major risk factors being prematurity, low birth weight, oxygen supplementation and RDS. In addition, however, risk factors like gestational diabetes, phototherapy and sepsis also show significant association with ROP which is reported only by few other studies only.

REFERENCES

1. Painter, S. L., Wilkinson, A. R., Desai, P., Goldacre, M. J. & Patel, C. K. Incidence and treatment of retinopathy of prematurity in England between 1990 and 2011: Database study. *Br. J. Ophthalmol.* **99**, 807–811 (2015).
2. Dwivedi et al. Prevalence, risk factors and pattern of severe retinopathy of prematurity in eastern Madhya Pradesh, Indian Journal of Ophthalmology: June 2019 - Volume 67 - Issue 6 - p 819-823
3. Schaffer DB, Palmer EA, Plotsky DF, et al. Prognostic factors in the natural course of retinopathy of prematurity. The Cryotherapy for Retinopathy of Prematurity Cooperative Group. *Ophthalmology*. 1993;100(2):230–7
4. Campbell K (1951) Intensive oxygen therapy as a possible cause of retrolental fibroplasia; a clinical approach. *Med J Australia*, 1951 Jul 2(2):48–50
5. Park SH, Yum HR, Kim S, Lee YC. Retinopathy of prematurity in Korean infants with birthweight greater than 1500 g. *Br J Ophthalmol.* 2016 Jun;100(6):834–8. doi: 10.1136/bjophthalmol-2015-306960. Epub 2015 Oct 19. PMID: 26483442