VOLUME-8, ISSUE-3, MARCH-2019 • PRINT ISSN No 2277 - 8160

Original Research Paper

Ophthalmology

STUDY OF INCIDENCE AND RISK FACTORS OF RETINOPATHY OF PREMATURITY IN SICK NEONATAL CARE UNIT IN TERTIARY CARE CENTRE

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ABSTRACT

Purpose: Retinopathy of prematurity is a preventable cause of childhood blindness with increased prevalence due to increased survival of premature babies. Hence identification of risk factors at the earliest helps in preventing the disease progression.

Aim: To identify the incidence, risk factors of Retinopathy of Prematurity in preterm neonates admitted in sick neonatal care unit over the period of 8 months.

Materials and Methods: A clinical retrospective study was done among 105 preterm neonates admitted in SNCU between April 2018 to December 2018. Fundus examination with indirect ophthalmoscope using 28 D lens was done.

Results: 23 babies were found to have ROP at various stages. In extremely low birth weight babies (<1000 g; n = 12), 6(50%) had ROP. Among very low birth weight baby neonates (<1500 g; n = 63), 11(17.4%) had ROP. Among low birth weight neonates (>1500 g; n = 30), 6 (20%) had ROP. In neonates less than 28 weeks (n = 14), 7(50%) had ROP, neonates between 28- 32 weeks (n = 51), 10(19.6%) had ROP, neonates more than 32 weeks (n = 40), 6(15%) had ROP

Conclusion: Prematurity and LBW were found to be independent risk factors for developing ROP in new born.

KEYWORDS : Low birth weight; prematurity; retinopathy of prematurity

INTRODUCTION

Retinopathy of Prematurity (ROP) is a new and fast emerging cause of childhood blindness in India due to increased survival of premature babies[1], lack of awareness and mandatory screening programme. Prematurity is considered as one of the most important risk factor of ROP. Other fetal risk factors include low birth weight (LBW), high oxygen supplementation and its duration, respiratory distress syndrome (RDS), anemia,sepsis, and blood transfusion.[2] Unrecognized and untreated ROP will cause potential blindness in children. Hence, close follow up is necessary during its evolution and treat if it reaches a potentially severe stage.

LITERATURE SURVEY

Retinopathy of Prematurity (ROP) was originally designated Retrolental Fibroplasia (RLF) by Dr. Theodore L. Terry who first connected the condition with premature birth. He proposed that the primary change was the proliferation of the embryonic hyaloid system which incorporated the retina. He stated the unilateral pathological specimens and provided details which that may be identical with bilateral retrolental fibroplasia. Heath coined the term ROP in 1951. In 1951, Dr Kate Campbell observed that, in a smaller hospital each infant's family was charged for each tank of oxygen that was used and thus much less oxygen was administered, and there was a lower incidence of RLF. She concluded that, "normal oxygen environment required for full-term infant is abnormal for the premature infant".

MATERIALS AND METHODS

A clinical retrospective study was conducted among -- preterm babies admitted in the Sick Neonatal Care Unit (SNCU) for ROP screening between April 2018 to December 2018.

Ethical clearance was obtained from the Ethical Committee of Government Mohan Kumaramangalam Medical College and Hospital. Neonates with birth weight < 2000 g, gestational age of < 36 weeks and high risk babies with 2 weeks of post natal age were screened. Before fundus examination, pupillary dilatation was achieved with 0.5% tropicamide and 2.5% phenylephrine eye drops instilled twice with a gap of 15 minutes. Indirect ophthalmoscopy with +28 D lenses was done under topical proparacaine with the help of pediatric eye speculum (Alfonso) and infant scleral depressor. Staging of ROP was done according to the international classification of ROP [Table 1]. The babies were followed-up weekly till the vascularization reached zone 3.[3] Follow-up interval was different according to disease severity with more severe disease requiring shorter follow-up interval.

RESULTS

Out of the 105 babies included in the study 56(53.3%) were males and 49 (46.6%) were females. Mean birth weight of the babies was 1324 g, ranging from 750 to 2000 gm. Correlation between stages of ROP with birth weight and gestational age is presented in Tables 2 and 3. Most of the babies presented for screening were in the gestational age of 28–32 (39%) and birth weight of 1–1.5 kg (49.5%). Twenty three (21.9%) out of 105 babies were found to have ROP in various stages. A total of 69.5% of the babies with ROP were in stage 1 disease, 17.3% in stage 2, and 13% in stage 3.

Birth weight and retinopathy of prematurity

In extremely low birth weight babies (<1000 g; n = 12), 6(50%) had ROP. Among very low birth weight baby neonates (<1500 g; n = 63), 11(17.4%) had ROP. Among low birth weight neonates (>1500 g; n = 30), 6 (20%) had ROP, which was found to be statistically significant (P < 0.05) [Table 2].

Gestational age and retinopathy of prematurity

In neonates less than 28 weeks (n = 14), 7(50%) had ROP, neonates between 28- 32 weeks (n = 51), 10(19.6%) had ROP, neonates more than 32 weeks (n = 40), 6(15%) had ROP [Table 3].

Table 1: International classification of retinopathy of prematurity

Stage	Features
I	Demarcation line (between vascular and avascular retina)
II	Ridge (elevated demarcation line)
III	Ridge with extra retinal fibrovascular proliferation
IV	Subtotal retinal detachment
A	not involving fovea
B	involving fovea
V	Total retinal detachment

PLUS disease, dilatation of posterior pole vessels. Threshold disease, stage 3 plus disease in zone 1 or zone 2, 5 contiguous clock hours or 8 noncontiguous clock hour involvement

Table 2: Correlation between birth weight and retinopathy of prematurity stages

Birth weight groups (grams)	Stage				Total
	0	1	2	3	
<1000	6	3	1	2	12
1000-1500	52	8	2	1	63
1500-2000	24	5	1	0	30
Total	82	16	4	3	105

Table 3: Correlation between gestational age and retinopathy of prematurity stages

Gestational age groups (weeks)	Stage				Total
	0	1	2	3	
<28	7	4	1	2	14
28-32	41	7	2	1	51
32-36	34	5	1	0	40
Total	82	16	4	3	105

Table 4: Previous studies on risk factors of retinopathy of prematurity

Author	Sample size	Incidence of ROP(%)			
		Overall	<32 weeks	<1000 g	<1500 g
Charan et al. [8]	165	47.27	-	90	-
Varughese et al.[9]	79	51.89	-	-	-
Palmer et al.[10]	4099	65.8	-	81.6	-
Clark et al.[11]	204	51	51.5	-	60.5
Our study	105	21.9	26.1	50	17.4

DISCUSSION

ROP is regarded as one of the important cause of preventable blindness in children.[4] Vision 2020 – right to sight gives special importance in preventing blindness in children. Retinal vascularization normally proceeds from the optic disc to the periphery and is completed nasally by 36 weeks of gestation and on the temporal side by 40 weeks of gestation.[6] ROP has a typical progression pattern; however, early stages of the disease may regress spontaneously at any time. [5] As the disease progresses, vitreous hemorrhage and tractional retinal detachment can occur. The end stage of untreated ROP is the development of a dense, white fibrovascular plaque behind the lens with complete retinal detachment, where the child goes completely blind. Among the risk factors, low gestational age and LBW are the most important factors that determine the development of ROP.[7] The incidence of ROP in premature babies and LBW babies in our study is comparable with previous studies [Table 4]. A total of 17.4% of babies of less than 1.5 kg and 26.1% babies with gestational age group <32 weeks had ROP. Independent, significant association was found between the development of ROP and the above mentioned risk factors. Mean birth weight of babies having ROP was 1.324 kg and mean gestational age was 30.27 weeks. There was no significant gender difference in affected babies. Thus Visual disability due to Retinopathy of Prematurity is preventable when detected and treated in time.

CONCLUSION

Prematurity and LBW are independent risk factors in the development of ROP in newborn babies. Prematurity along with LBW had more chances of developing ROP. Hence screening of the babies at an earliest of 2 weeks of their birth and weekly follow-up will allow us to detect ROP at their early stages. This will prevent further progression and blindness with appropriate treatment.

Financial support and sponsorship: Nil.

Conflicts of interest
There are no conflicts of interest.

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