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Original Research Article

A clinical study of retinopathy of prematurity in neonates in a tertiary care hospital

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ABSTRACT

Background: Retinopathy of prematurity (ROP) is a disease process mostly reported in preterm neonates with a wide spectrum, ranging from mild, transient changes in the retina with regression to severe progressive vasoproliferation, scarring, detachment of retina and blindness. India shares 20% of the world childhood blindness. Besides congenital cataract, congenital glaucoma and ocular injuries, ROP is emerging as one of the important causes of childhood blindness in India.
Methods: A cross sectional study was undertaken among all neonates born between 28-34 weeks of gestation admitted in NICU, who are under oxygen, screened for ROP. Babies with ocular disorder which interfere with fundus examination, babies who did not complete follow up till complete vascularisation of retina and babies with congenital retinal abnormalities were excluded from the study.
Results: About 13.3% of male children and 18.0% of the female children had retinopathy of prematurity. Among the infants born before 30 weeks, 46.7% had retinopathy of prematurity. In the children with gestational age between 30-32 weeks, 15.4%, 8.5% in the 32-35 weeks and none among those born between more than 35 weeks. About 27.9% of the newborns with birth weight of less than 1.5kgs and 5.8% of those who had birth weight of 1.5-2.5kgs had retinopathy of prematurity.
Conclusions: This study had shown a significant association of retinopathy of prematurity with the low gestational age, birth weight and oxygen therapy. Reducing subsequent post-natal risk factors depends on optimal perinatal and postnatal care, as well as adhering to strict ROP screening guidelines. Recognizing and treating ROP in a timely fashion is critical for achieving the best visual outcome.

Keywords: Oxygen therapy, Preterm, Retinopathy of prematurity

INTRODUCTION

Retinopathy of prematurity (ROP) is a disease process mostly reported in preterm neonates with a wide spectrum, ranging from mild, transient changes in the retina with regression to severe progressive vasoproliferation, scarring, detachment of retina and blindness. The retinopathy of prematurity can be treated effectively if it is identified at earliest possible point of time. In 1942, Terry first described retrolental fibroplasia with implication of oxygen therapy as the causative agent.[1] It is well known that oxygen therapy is not the single causative factor, but many other risk factors play a causative role in the pathogenesis of ROP.[2,3] There are approximately 50 million blinds in the world today of which 30% are living in Asia alone. Of the total blindness 4% account for childhood blindness which comes to 2 million. India shares 20% of the world childhood blindness. Besides congenital cataract, congenital glaucoma and ocular injuries, ROP is emerging as one of

the important causes of childhood blindness in India. It is estimated that out of 100 preterm infants, 20 to 40 develop ROP, out of which 3-7 become ultimately blind.[4] It occurs in over 16% of all premature births. In babies weighing less than 1,700 grams at birth, over 50% are known to develop ROP.[5,6] The incidence of ROP in developed countries is 10-27%, depending on the degree of prematurity and birth weight.[7,8] In developing countries like India, the incidence of ROP has been reported at 24 -47% among the high-risk preterm infants.[9,10] Improved neonatal care has increased the survival of very low birth weight and premature babies and has consequently increased the incidence of ROP.[3] The studies pertaining to retinopathy of prematurity are scant in this part of the country. Hence this study was taken up with the purpose to know the correlation between oxygen administration and retinopathy of prematurity.

METHODS

A cross sectional study was undertaken among all neonates born between 28-34 weeks of gestation admitted in neonatal intensive care unit (NICU) of Basaveshwara medical college hospital and research centre, Chitradurga who are under oxygen supplementation were screened for ROP.

Inclusion criteria

- All neonates born between 28-34 weeks of gestation admitted in NICU, who are under oxygen, screened for ROP were included in the study.

Exclusion criteria

- Babies with ocular disorder which interfere with fundus examination, babies who did not complete follow up till complete vascularisation of retina and babies with congenital retinal abnormalities were excluded from the study.

The sample size was derived on the basis of number of babies fitting to study inclusion criteria admitted to NICU during the study period.

Stastical analysis

The data thus obtained was entered in Microsoft excel sheet and transferred and analyzed using statistical package for social services (SPSS vs 20). The categorical data was presented as frequencies and percentages and quantitative data was presented as measures and central tendency and dispersion. Chi square test was used as test of significance for the categorical variables.

A logistic regression analysis was conducted to study the association of various risk factors with occurrence of retinopathy of prematurity. A p value of less than 0.05 was considered as statistically significant.

RESULTS

A total of 95 neonates which were admitted to the NICU were studied for retinopathy of prematurity. Out of these 45 babies were male and 50 babies were females. About 13.3% of male children and 18.0% of the female children had retinopathy of prematurity. This difference was not statistically significant between the occurrences of retinopathy of prematurity with sex (Table1).

Table 1: Distribution of the babies according to sex and retinopathy of PREM.

Sex of the baby	ROP	
	Absent N (%)	Present N (%)
Male	39 (86.7)	6 (13.3)
Female	41 (82.0)	9 (18.0)
Total	80 (84.2)	15 (15.8)

χ^2 value=0.388, df=1,p value=0.533, Not significant.

Among the infants born before 30 weeks, 46.7% had retinopathy of prematurity. In the children with gestational age (GA) between 30 -32 weeks, 15.4%, 8.5% in the 32-35 weeks and none among those born between more than 35 weeks. There was a statistically significant difference in the retinopathy of prematurity and gestational age (Table 2).

Table 2: Distribution of the babies according to gestational age and retinopathy of prematurity.

Gestational age	ROP	
	Absent N (%)	Present N (%)
< 30 weeks	8 (53.3)	7 (46.7)
30-32 weeks	22 (84.6)	4 (15.4)
32-35 weeks	43 (91.5)	4 (8.5)
More than 35 weeks	7 (100)	0
Total	80 (84.2)	15 (15.8)

χ^2 Value=13.944, df=3, p value=0.003, Significant.

About 27.9% of the newborns with birth weight of less than 1.5 kgs and 5.8% of those who had birth weight of 1.5 -2.5 kgs had retinopathy of prematurity. There was a statistically significant difference in the birth weight and retinopathy of prematurity (Table 3).

Table 3: Distribution of the babies according to birth weight and retinopathy of prematurity.

Birth weight	ROP	
	Absent N (%)	Present N (%)
Less than 1.5kg	31 (72.1)	12 (27.9)
1.5-2.5kg	49 (94.2)	3 (5.8)
Total	80 (84.2)	15 (15.8)

χ^2 Value=8.675, df=1, p value=0.003, Significant.

This study had shown that, about 15.8% of the patients where oxygen was not administered oxygen had retinopathy of prematurity (Table 4).

Table 4: Distribution babies according to oxygen administration and retinopathy of prematurity.

Oxygen administration	ROP	
	Absent N (%)	Present N (%)
Not given	80 (84.2)	15 (15.8)
Given	0	0
Total	80 (84.2)	15 (15.8)

DISCUSSION

Retinopathy of prematurity (ROP) is a common disease of preterm neonates with variable degree of involvement ranging from mild, transient changes in the retina with regression to severe progressive vasoproliferation, scarring, detachment of retina and Blindness. The literature available had shown that, approximately 50 million blinds in the world today due to ROP and 30% of them are living in Asia alone. India contributes to 20% of the world childhood blindness. Improved neonatal care has increased the survival of very low birth weight and premature babies and has consequently increased the incidence of ROP.[3]

About 13.3% of male children and 18.0% of the female children had retinopathy of prematurity in this study which was not statistically significant. In a study by Yang et al, 50% infants with no ROP 26.4% without surgery and 23.6% with surgery were boys.[11] In a study by Shetty et al, 6 cases with ROP were males and 6 cases were females.[12] This study had shown that, 46.7% of the newborns born within 30 weeks of gestation had retinopathy of prematurity. The incidence decreased with increase in the gestational age which was also statistically significant. A study by Yang et al, had shown that mean gestational age of infants with no ROP was 30.3 weeks, 28.1 weeks in ROP without surgery and 26.9 weeks in ROP with surgery.[11] In a study by Shetty et al, 4 cases of ROP had gestational age of 30-32 weeks, 4 cases GA of 32-34 weeks and 4 cases had GA of 34-36 weeks.[12] In a study by Abdel et al, the gestational age was less than 32 weeks in 33.3% of the ROP cases and 9.4 of the cases without ROP.[13]

The retinopathy of prematurity was common in the newborns with low gestational age which was statistically significant. In a study by Abdel et al, the birth weight was less than 1kg in 6% of the cases of ROP and 0.7% of the cases without ROP and between 1kg to 1.5kg in 48.5% of the cases with ROP and 51.1% of the cases without ROP.[13] Yang et al, have observe that the mean birth weight was 1251gms in infants without ROP 1014gms in ROP without surgery and 954gms in ROP with surgery.[11] The birth weight of 2 cases was between 750-1000gms, 8 cases had birth weight of 1001-1500gms and 2 cases had birth weight of 1501-2000gms.[12] About 15.8% of the patients where oxygen was not administered oxygen had retinopathy of prematurity. In a study by Abdel et al, the oxygen was used in 66.7% of the ROP cases and 43.9% of the cases without ROP.[13] In a study by Shetty et al, the oxygen supplementation was present in 10 cases of ROP and absent in 2 cases of ROP.[12]

CONCLUSION

This study had shown a significant association of retinopathy of prematurity with the low gestational age, birth weight and oxygen therapy. Therefore, preventing ROP begins with preventing prematurity through optimal prenatal care. Reducing subsequent post-natal risk factors depends on optimal perinatal and postnatal care, as well as adhering to strict ROP screening guidelines. Recognizing and treating ROP in a timely fashion is critical for achieving the best visual outcome. ROP and its sequelae can cause problems throughout a patient's life; therefore, long-term monitoring by an ophthalmologist is crucial.

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