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INCIDENCE OF RETINOPATHY OF PREMATURITY IN NEONATES IN NARAYAN MEDICAL COLLEGE AND HOSPITAL JAMUHAR, BIHAR, INDIA

Pediatrics

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ABSTRACT

Background: Retinopathy of prematurity (ROP) is a vasoproliferative disease mostly affects preterm neonates with a wide spectrum, ranging from mild, transient changes in the retina 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 25-34 weeks of gestation admitted in NICU in in Narayan medical college and hospital jamuhar. 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 vascularization of retina and babies with congenital retinal abnormalities were excluded from the study.

Result: The incidence of ROP of any stage in NICU was determined to be 306 (45%) of all babies enrolled in this study. In present study, key risk factors of ROP were low gestational age, oxygen therapy more than five days and low birth weight.

KEYWORDS

Oxygen therapy, Preterm, Retinopathy of prematurity

INTRODUCTION

Retinopathy of prematurity (ROP) is a disease 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 fibroplasias 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). Besides congenital cataract, congenital glaucoma and ocular injuries, ROP is emerging as one of 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). 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 25-34 weeks of gestation admitted in neonatal intensive care unit (NICU) of Narayan medical college and hospital jamuhar who are under oxygen supplementation were screened for ROP. The sample size was derived on the basis of number of babies fitting to study inclusion criteria admitted to NICU during the study period.

STASTICALANALYSIS

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.

RESULT

During the study, 680 of 865 VLBW new-borns who were referred were followed up for ROP development. 425 (62.5%) males and 255 (37.5%) females were involved in ROP group. Table 1 shows the average birth weight was 1713.9 ± 416.7 grams and the average gestational age was 31.45 ± 2.21 weeks (7% was 25-28 week, 55% was 29-32 week and 38% was more than 32 week).

The overall incidence of ROP in any stage was 306 (45%) among babies who referred to ophthalmology centre. Of 306 subjects, 52 (16.99%) subjects were in stage I of ROP, 193 (63.07%) subjects were in stage II and 61 (19.93%) subjects were in stage III or III^{+}.

Table 1. Demographic and perinatal characteristics of the study neonates.

Characteristic	No (N %)
Sex	
Male	425 (62.5%)
Female	255(37.5%)
Mean birth weight (gr)	1713.9 ± 416.7
Birth weight(groups)	
500-1000	48(7%)
1001-1500	197(29%)
1501-2000	292(43%)
>2000	143(21%)
Gestational age	
25-28	48(7%)
29-32	374(55%)
>32	258(38%)
Delivery type	
NVD	201(29.5%)
CS	479(70.5%)
RDS	
Yes	524(77%)
No	156(23%)
Sepsis	
Yes	113(16.7%)
No	567(83.3%)
Mean duration of oxygen therapy (day)	5.21 ± 2.45

Table 2 shows the results of logistic regression for all independent variables. There was a significant relationship between GA of 32 weeks or less and ROP (P<0.001). Furthermore, it was observed that babies with BW of less than 1500 g are 3.5 times more at risk for ROP compared to babies with 1500g or more. A significant relationship was observe between sepsis and ROP (P<0.001).

Table 2. Simple regression analysis results for ROP.

Characteristic		ROP N (%)	No ROP N (%)	OR	CI	P-Value
Sex	Male	211(69%)	214(57.2%)	0.787	0.034-1.78	0.50
	Female	95(31%)	160(42.8%)			
GA	<32W	141(46%)	71(19%)	2.913	1.237-6.862	0.01
	≥32w	165(54%)	303(81%)			
Oxygen therapy >5 day	Yes	267(87.2%)	245(65.5%)	1.793	0.629-5.110	0/32
	No	39(12.8%)	129(34.5%)			
RDS	Yes	141(46%)	183(49%)	0.853	0.380-1.913	0/87
	No	165(54%)	191(51%)			
Sepsis	Yes	65(21%)	41(10%)	2.889	1.093-7.633	0.04
	No	241(79%)	333(90%)			
Birth weight(gram)	<1500gr	133(43.5%)	83(22.1%)	3.512	1.415-8.719	0.007
	1500gr≤	173(56.5%)	291(77.9%)			
ROP stage	I II III	52(16.99%) 193(63.07%) 61(19.93%)	0(0%) 0(0%) 0(0%)	2.713	1.123-7.766	0.001

In ROP group, the mean oxygen therapy was 7.12 ± 4.32 day and this value in healthy group was 3.23 ± 2.18 day. Thus, there is no significant relationship between oxygen therapy with ROP (P>0.05).

DISCUSSION

In current study, the incidence of ROP in any stage, from February 2015 to December 2019 was 306 (45%) among babies referred to ophthalmology centre for ROP screening. ROP is considered as an important avoidable cause of blindness in children in countries with high human development index and also in some emerging economies countries. The ROP rate in the current study was 45 %, which was higher as compared to available literature in this context including 32.4 % in Pakistan [11], 29.5 % in Tehran [12], 29.2 % in Singapore [14], 29 % in Kerman (southern Iran) [15], and 10.45 % in the United States [13]. Moreover, Sabzehi *et al.* [16] reported that the ROP incidence in Tehran was 17.4 % in 3 years study. In another study conducted by Mousavi *et al*. [17], the prevalence of ROP in Farabi hospital of Tehran was 34.4% in 4 years. Furthermore, the ROP prevalence was reported 37.1% by Mutlu *et al.* [18].

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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