



ORIGINAL RESEARCH PAPER

Ophthalmology

INCIDENCE AND PROGRESSION OF RETINOPATHY OF PREMATURITY IN PREMATURE INFANTS IN RELATION TO ANEMIA

KEY WORDS:

Dr.G.Balaji

Associate Professor of Ophthalmology, Govt.Chengalpet Medical College.

Dr.S.Abirami*

Senior resident, Govt.Chengalpet Medical college. *Corresponding Author

ABSTRACT

This study aims to correlate the incidence and progression of retinopathy of prematurity(ROP) in premature infants with anemia. Materials and Methods: All high-risk infants from our hospital and neighboring districts were screened at Special newborn care unit every Tuesday on regular basis, and this study includes infants screened at NICU during January 2018 – March 2018. Conclusion: In our study at, high-risk premature infants who were screened showed a significant prevalence of ROP in babies weighing <2.000 kg and with female preponderance. The role of anemia and other neonatal risk factors needs to be evaluated further in our ongoing study.

Introduction

Retinopathy of prematurity (ROP) is a disease of the retina affecting the preterm babies. It is a vascular disease, found only in infants with immature, incompletely vascularised retina, hence its connection with premature birth.[1]

Pathogenesis

In premature infants with respiratory distress, higher concentration of oxygen supplementation(SPO2) causes injury to the developing immature vessel).[2],[3]

Induced hyperoxia causes downregulation of vascular endothelial growth factor (VEGF) and death of endothelial cells. Following the closure of these growing vessels, the differentiating retina becomes increasingly ischemic and hypoxic, and VEGF is upregulated inducing neovascularization.

Risk factors

Prematurity, low birth weight and prolonged supplemental oxygen are established risk factors for the development of ROP. Other risk factors include cyanosis, apnea, respiratory distress, mechanical ventilation, intraventricular hemorrhage, seizures, sepsis, in utero hypoxia, anemia, multiple blood transfusion and Vitamin E deficiency..[4],[5]

Aim of the study

Hence, a study was conducted in NICU to correlate the incidence and progression of ROP with anemia in premature infants

Materials and Methods

All high-risk premature infants from our hospital and neighboring districts evaluated during the period January 2018–March 2018 were included in the study.[6] Indices included for this study are gestational age, chronological age, birth weight, gender, referral district, staging of ROP, respiratory status and hemoglobin levels.

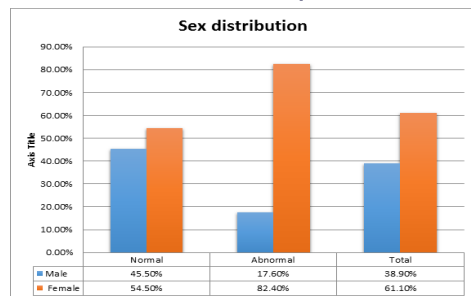
Infants were dilated with tropicamide every 15 min for three times, and the fundus examination was carried out at Neonatal Intensive Care Unit. Using wire speculum after instillation of topical anesthetics, fundus examination was done using binocular indirect ophthalmoscope and with scleral indentation. Topical antibiotic drops were instilled at the end of the examination.

All details were recorded in the ROP chart [Table 1] and [Figure 1].

Table 1: No of premature babies screened

	No. of premature babies (%)
Normal	55(76.4)
Abnormal	17(23.6)
Total	72(100)

Figure 1: Screened male and female premature infants



Discussion

A total of 72 infants were screened in our study. Most of the infants were found to be between 30 and 60 days of birth (40.5%) and below 30 days were of 36.1% [Table 2], [Table 3] and [Figure 2].

Table 2: Age of the preterm infant

PARTICULARS	NUMBER OF RESPONDENTS
BELOW 30 DAYS	26(36.1)
31-60 days	29(40.3)
61-90 days	7(9.7)
91-120 days	7(9.7)
121-150 days	1(1.4)
151-180 days	2(2.8)
Total	72(100.0)

Table 3: Premature infants screened in relation to sex

Particulars	Number of respondants(%)
Male	28(38.9)
Female	44(61.1)
Total	72(100.0)

Figure 2: Affected vs normal premature infants in relation to birth weight

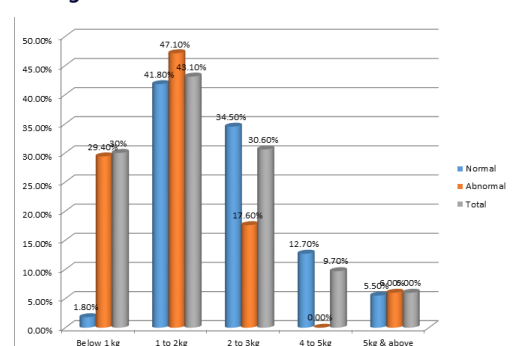


Table 3: Descriptive statistics

	n	minimum	Maximum	Mean	SD
Age	72	8	180	50.61	38.580
Gestational age	72	23	40	30.76	4.224
Weight	72	0.795	5.400	2.30396	1.147857
Hb	72	7.60	22.80	14.1806	2.79742

Tables 4: Respondents in relation to birth weight

PARTICULARS	NUMBER OF RESPONDANTS(%)
BELOW 1 KG	6(8.3)
1-2 kg	31(43.1)
2-3 kg	22(30.6)
3-4 kg	7(9.7)
4-5kg	2(2.8)
5 kg and above	4(5.6)
Total	72(100.0)

Table 5: Respondents in relation to gestational age

PARTICULARS	NUMBER OF RESPONDANTS(%)
<30 weeks	38(52.8)
31-40 weeks	34(47.2)
Total	72(100.0)

Table 7: Statistical inference of retinopathy of prematurity in relation to high risk factors age at screening, gestational age, birth weight, hemoglobin level

Stage	n	mean	SD	T	DF	Statistical inference
Age						
Normal	55	54.98	41.722	1.754	70	0.084>0.05(not significant)
Abnormal	17	36.47	21.252			
Gestational age						
Normal	55	31.25	4.287	1.801	70	0.076>0.05(not significant)
Abnormal	17	29.18	3.695			
Weight						
Normal	55	2.477 91	1.0990 45	2.388	70	0.020<0.05(significant)
Abnormal	17	1.741 18	1.1530 59			
Hb						
Normal	55	14.14 18	2.9603 4	-0.210	70	0.834>0.05(not significant)
Abnormal	17	14.30 59	2.2642 5			

Table 8: Respondents in relation to age sex place of birth gestational age and birth weight

	Normal, n (%)	Abnormal, n(%)	Total, n (%)	Statistical inference
Age				
Below 30 days	19(34.5)	7(41.2)	26(36.1)	, df=5 0.609>0.05 (not significant)
31-60 days	21(38.2)	8(47.1)	29(40.3)	
61-90 days	5(9.1)	2(11.8)	7(9.7)	
91-120 days	7(12.7)	0	7(9.7)	
121-150 days	1(1.8)	0	1(1.4)	
151-180 days	2(3.6)	0	2(2.8)	
Sex				
Male	25(45.5)	3(17.6)	28(38.9)	, df=1 0.040<0.05 (significant)
Female	30(54.5)	14(82.4)	44(61.1)	

Place				
Chengalpattu	46(86.3)	13(76.50)	59(81.9)	, df=3 0.624>0.05 (not significant)
Kanchipuram	3(5.5)	2(11.8)	5(6.9)	
Vandavasi	5(9.1)	1(5.9)	6(8.3)	
Villupuram	1(1.8)	1(5.9)	2(2.8)	
Gestational age				
Below 30 days	26(47.3)	12(70.6)	38(52.8)	, df=1 0.092>0.05 (not significant)
31-40 days	29(52.7)	5(29.4)	34(47.2)	
Type of cases				
New cases	30(54.5)	15(88.2)	45(62.5)	, df=1 0.012<0.05 (significant)
Old cases	25(45.5)	2(11.8)	27(37.5)	
Weight				
Below 1 kg	1(1.8)	5(29.4)	6(8.3)	, df=5 0.007<0.05 (significant)
1-2 kg	23(41.8)	8(47.1)	31(43.1)	
2-3 kg	19(34.5)	3(17.6)	22(30.6)	
3-4 kg	7(12.7)	0	7(9.7)	
4-5 kg	2(3.6)	0	2(2.8)	
5kg and above	3(5.5)	1(5.9)	4(5.6)	
Total	55(100)	17(100)	72(100)	

Conclusion

In our study, it showed a higher prevalence of ROP in babies weighing <2 kg and with female preponderance. The role of anemia and other neonatal risk factors in ROP needs to be evaluated further in our ongoing study.[7],[8],[9],[10]

References

- Gilbert C. Retinopathy of prematurity: A global perspective of the epidemics, population of babies at risk and implications for control. Early Hum Dev 2008;84:77-82. Back to cited text no. [PUBMED]
- Alon T, Hemo I, Itin A, Pe'er J, Stone J, Keshet E, et al. Vascular endothelial growth factor acts as a survival factor for newly formed retinal vessels and has implications for retinopathy of prematurity. Nat Med 1995;1:1024-8. Back to cited text no. 2
- Hellstrom A, Perruzzi C, Ju M, Engstrom E, Hard AL, Liu JL, et al. Low IGF-I suppresses VEGF-survival signaling in retinal endothelial cells: Direct correlation with clinical retinopathy of prematurity. Proc Natl AcadSci U S A 2001;98:5804-8. Back to cited text no. 3
- Liu PM, Fang PC, Huang CB, Kou HK, Chung MY, Yang YH, et al. Risk factors of retinopathy of prematurity in premature infants weighing less than 1600 g. Am J Perinatol 2005;22:115-20. Back to cited text no. 4
- Maheshwari R, Kumar H, Paul VK, Singh M, Deorari AK, Tiwari HK, et al. Incidence and risk factors of retinopathy of prematurity in a tertiary care newborn unit in new Delhi. Natl Med J India 1996;9:211-4. Back to cited text no. 5
- Fierson WM; American Academy of Pediatrics Section on Ophthalmology; American Academy of Ophthalmology; American Association for Pediatric Ophthalmology and Strabismus; American Association of Certified Orthoptists. Screening examination of premature infants for retinopathy of prematurity. Pediatrics 2013;131:189-95. Back to cited text no. 6
- Fortes Filho JB, Eckert GU, Valliatti FB, Dos Santos PG, da Costa MC, Procianny RS, et al. The influence of gestational age on the dynamic behavior of other risk factors associated with retinopathy of prematurity (ROP). Graefes Arch ClinExpOphthalmol 2010;248:893-900. Back to cited text no. 7
- Gibson DL, Sheps SB, Uh SH, Schechter MT, McCormick AQ. Retinopathy of prematurity-induced blindness: Birth weight-specific survival and the new epidemic. Pediatrics 1990;86:405-12. Back to cited text no. 8
- Gilbert C, Rahi J, Eckstein M, O'Sullivan J, Foster A. Retinopathy of prematurity in middle-income countries. Lancet 1997;350:12-4. Back to cited text no. 9
- Englert JA, Saunders RA, Purohit D, Hulsey TC, Ebeling M. The effect of anemia on retinopathy of prematurity in extremely low birth weight infants. J Perinatol 2001;21:21-6.