ISSN: 0975-3583,0976-2833 VOL14, ISSUE5, 2023

Demographic Profile of Preterm Babies Screened for ROP during the COVID Pandemic at a Tertiary Care Children's hospital in Telangana

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Abstract

Retinopathy of prematurity is an important cause of preventable blindness in children. With the availability of better Neonatal ICU and SNCU facilities, the survival rates of preterm babies have drastically increased with it the number of babies to be screened also increased. Niloufer Hospital being a tertiary care institute for children has been an epicenter where all the sick preterm babies are treated.

Objective-To estimate the prevalence of ROP in pre-term infants, identify the risk factors which predispose to ROP, and assess the outcome of these cases.

Material and methods -The preterm babies who attended the screening between April 2020 and 2021 who attended the ROP screening at Niloufer Hospital were retrospectively analyzed. ROP screening was done with Indirect ophthalmoscopy and 20 diopter lens. Babies born at 34 weeks and birth weight less than 1.5 kg and those born between 34 to 37 weeks with a turbulent early post-natal period or a low birth weight or by the discretion of the pediatrician were evaluated. Perinatal risk factors and those who developed rop were assessed.

Results -660 babies were screened of whom 325(49.24%) were males and 335 (50.76%) were females. The mean birth weight of the screened babies was 1266gm and the mean gestational age of the screened babies was 32.46 weeks. ROP was seen in 27.12% of the babies and severe ROP was seen in 9% of babies.

Conclusion-This study done during the covid period emphasizes the importance of screening and the incidence of ROP and severe ROP was similar to other studies from India. However, the longer duration of the study would give the trends of ROP.

Keywords- COVID, ROP, ICU and SNCU facilities.

INTRODUCTION

Retinopathy of prematurity is an important cause of preventable blindness in children. Terry first described the end stage of ROP in 1942[1]. The incidence of ROP is estimated to be 19.3 % to 41.5% in various studies. [2] With the improvement of neonatal services in the NICU and SNCU (Special neonatal care unit) the survival of low-birth-weight pre-term babies has increased. These babies are more prone to ROP and hence the number of babies needed to be screened has drastically increased.

The retinal blood vasculature primarily comes from the hyaloid artery. By the 16th week of gestation, the secondary retinal vasculature starts from the disc as a wave of mesenchymal spindle cells towards the ora serrata. the nasal ora serrata is vascularized by the 28th to 32nd week of gestation and the temporal ora serrata by the 40 to 44th week. In utero, the fetus is in a hypoxic state with PaO2 of 22 to 24 mm Hg in contrast to a full-term newborn and adult state where the PaO2 is 70 to 90 mmHg. The hypoxic state in utero stimulates the vascular endothelial growth factor (VEGF)and is very important for the growth of vessels in the immature retina of the fetus. in a pre-term born, oxygen supplementation is very widely used and this hyperoxia state inhibits the production of VEGF. Prolonged hyperoxic states also cause vasoconstriction and vaso obliteration due to the lack of VEGF. Over time the ischemic retina stimulates the production of VEGF. If the ischemic retina is large then it induces new vessels at the vascular and avascular junction.

According to the IAP and NNF guidelines, the first screening has to be done at 3 to 4 weeks of life. In very early preterm who are usually born with a very low birth weight and are more oxygen dependent the screening can be done early as 2 weeks of life. [1]

Niloufer Hospital for Mother and Children is a center of excellence and tertiary care center for neonatology in the government sector in Telangana that deals with a very large number of babies. Hence this study was conducted to analyze the prevalence and risk factors for the development of ROP.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE5, 2023

MATERIALS AND METHODS

660 babies who have attended the neonatal and ROP screening at the Niloufer Mother and Child Institute and who have been screened between April 2020 and March 2021 were analyzed retrospectively. Eye screening was done in the NICU using a binocular indirect ophthalmoscope with 20 diopter lens and the findings were recorded. Pupils were dilated by using diluted tropicamide and phenylephrine drops (diluted 50% with carboxy methyl cellulose) according to the standard protocol. Standard covid precautions were taken as the study was conducted during the Covid pandemic.

First screening was done at 2 to 3 weeks after birth and follow-ups were done according to the clinical findings according to the standard guidelines [1]. Details such as gender, birth weight, and gestational age at birth have been recorded. eye findings have been recorded at each visit mentioning the zone into which the vessels reached. If no ROP was seen it was documented as an immature retina and ant stage if present was documented. The presence of plus and pre-plus was documented. The follow-ups were done as per the guidelines till the child reaches the mature retina. [1] [11]

RESULTS:

TABLE 1 showing Mean GA and Mean BW in Various Groups

GA in weeks		No of Babies	PERCENT (%)	MEAN GA	Mean Birth Weight in grams
23.5- 28	Very Early Preterm	128	19.39	27.55	985
28-32	Early Preterm	236	35.76	30.77	1344
32-37	Late Preterm	256	38.79	34.74	1769
37 - 42	Term	40	6.06	39.24	2645

TABLE 2 showing Number of Babies with ROP and Percentage

ROP	No of Babies	Percentage (%)
Stage 1	119	18.03
Stage 2	101	15.30
Stage 3	12	1.82
APROP	47	7.12

TABLE 3 showing Distribution of ROP in Various Zones with Percentage

	No of Babies	Percentage (%)
Zone 1 ROP	19	6.81
Zone 2 ROP	257	92.11
Zone 3 ROP	36	1.08

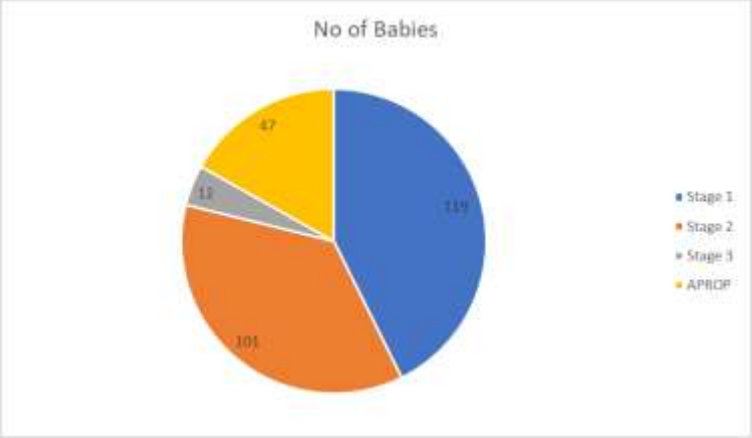

Fig-1

Records of 660 babies who attended the ROP screening between April 2020 to March 2021 were evaluated. Of these 325 (49.24%) Were males and 335(50.76%) were females. The gestational age of the screened babies ranged from 23.5. to 42 weeks. The babies who were above 37 weeks were screened at the pediatrician's discretion. They

ISSN: 0975-3583,0976-2833 VOL14, ISSUE5, 2023

had either a turbulent early neonatal period or an IUGR. The babies were grouped into very early preterm (25 to 28 weeks), early preterm (28-32 weeks), late preterm (32-37 weeks), and term (beyond 37 weeks).

The mean age at first examination of the babies was 3 weeks. There were 128 (19.39%) babies in the very early preterm group (25 to 28 weeks). The mean gestational age of this group was 27.5 weeks. The birthweight was in the range of 600 to 1200 gm with a mean of 985 gm.

236 (35.76%) babies were in the early preterm group (28- 32 weeks) with a mean gestational age of birth was 30weeks. The mean birth weight in this group was 1344 gm.

In the late preterm group (32- 37 weeks) there were 256 babies (38.79%) with a mean gestational age of 34 weeks and the mean birth weight in this group was 1769 gm.

In the term babies group (37 – 42 weeks) there were 40 babies (6.06%) with a mean gestational age of 39 weeks and mean birth weight of 2645gm. 9 babies in this group were having a birth weight of less than 2000gm at birth. At presentation stage one was seen in 40 babies (6.21%) babies, stage 2 was present in 18 babies (2.73%), stage 3 was seen in 3 babies (0.45%) APROP was seen in 55 babies (6.6%) Stage 2 to progressed to stage 3 in 4 babies The percentage of babies with ROP was 27.12% (257) and the percentage of babies with severe ROP was 9% (60).119 babies were found to have stage 1 which constitutes 18.03%. stage two was seen in 101 babies (15.3%). stage 3 was found in 12 babies (1.82%) and APROP was seen in 47 babies (7.12%)

Retinopathy of prematurity was found in zone 2 in more than 90 percent of the babies (92.11%). zone 1 ROP was seen in 19 babies (6.81%) and zone 3 ROP was seen in 3 babies (1.08%)

For severe ROP Laser was done in 14(29.79%) babies and anti-VEGF was given in 33 (70.21%) babies.

DISCUSSION

The percentage of ROP in various studies varied from 16 % to 49% in various Indian studies[2]. Hakeem et al[12] reported an incidence of ROP was 19%. In our study, we found the percentage of babies with rop to be 27.12%. In a study conducted by Vasavada et al and Hungi et al[3], the mean birth weight of the screened babies was around 1550 grams. In a 5-year retrospective study done by Techchandani et al[2], the mean birth weight was 1277 grams, and, in a study conducted by Hakeem et al[12] r the mean birth weight was 1510 grams. In our study, the mean birth weight of the screened babies was found to be 1266gm.

The mean gestational age of the pre-term babies screened was in the range of 29 to 32 weeks in various studies and in our study, we found it to be 32.46 weeks.

Severe ROP in various studies done across India varied from 4.3% to 17.7% [2] and in our study, it was found to be 9%. The retinopathy of prematurity findings was predominantly seen in zone 2 (92.11%) which was similar to in other studies.

CONCLUSION

Our study being conducted in a tertiary child care center had a large sample size of 660 babies. This study shows the incidence of ROP was 27.12% and severe ROP was 9%. Larger data for a longer duration would show a better trend of the disease. ROP is a preventable cause of childhood blindness. With increasing and better neonatal care and survival of even very early preterm babies the incidence of rop and severe rop is increased. Prompt diagnosis and treatment must be emphasized and also regular follow-up is required, adequate counseling to the parents has to be given to avoid blindness.

REFERENCES

1. Terry T. Fibroblastic overgrowth of persistent tunica vasculosa lentis in infants born prematurely. Trans Am Ophthalmol Soc. 1942;40:262–84.
2. Tekchandani, Uday & Katoch, Deeksha & Dogra, Mangatram. (2021). Five-year demographic profile of retinopathy of prematurity at a tertiary care institute in North India. Indian Journal of Ophthalmology. 69. 2127. 10.4103/ijo.IJO_132_21
3. Ahuja AA, Reddy YC, Adenuga OO, Kewlani D, Ravindran M, Ramakrishnan R. Risk factors for retinopathy of prematurity in a district in South India: a prospective cohort study. Oman J Ophthalmol. 2018;11(1):33–7.
4. Hungi B, Vinekar A, Datti N, Kariyappa P, Braganza S, Chinnaiah S, et al. Retinopathy of Prematurity in a rural Neonatal Intensive Care Unit in South India--A prospective study. *Indian J Pediatr.* 2012;79:911–5

ISSN: 0975-3583,0976-2833 VOL14, ISSUE5, 2023

5. Vasavada D, Sengupta S, Prajapati VK, Patel S. Incidence and risk factors of retinopathy of prematurity in Western India-Report from A Regional Institute of Ophthalmology. *Nepal J Ophthalmol.* 2017;9:112–1120.
6. Harrell SN, Brandon DH. Retinopathy of prematurity: the disease process, classifications, screening, treatment, and outcomes. *Neonatal Netw.*2007;26:371–378.
7. Mintz-Hittner HA. Retinal development and the pathophysiology of retinopathy of prematurity. In: Pollin RA, Fox WW, Abman SH, eds. Fetal and neonatal physiology, Vol 2. Philadelphia: Saunders; 2011. p. 1875–1881.
8. Hughes S, Yang H, Chan-Ling T. Vascularization of the human fetal retina: roles of vasculogenesis and angiogenesis. *Invest Ophthalmol Vis Sci.*2000;41:1217–1228.
9. Clinical Practice Guidelines: Screening and Management of Retinopathy of Prematurity [Internet]. Delhi (IN): National Neonatology Forum; 2020. Jan, [2023 Feb 20;
10. Jalali, Subhadra MS; Anand, Raj MS; Kumar, Harsh MD; Dogra, Mangat R MS; Azad, Rajvardhan MD,FRCS (Ed); Gopal, Lingam MS. Programme Planning and Screening Strategy in Retinopathy of Prematurity.. Indian Journal of Ophthalmology 51(1):p 89-97.
11. Gopal L, Sharma T, Ramchandran S, Shanmugasundaram R, Asha V. Retinopathy of prematurity. A study Indian J Ophthalmol. 1995;43:50–61
12. Hakeem, H. A., Mohamed, G. B., & Othman, M. F. (2012). Retinopathy of Prematurity: A Study of Prevalence and Risk Factors. *Middle East African Journal of Ophthalmology*, *19*(3), 289-294.
13. Clinical Practice Guidelines: Screening and Management of Retinopathy of Prematurity [Internet]. Delhi (IN): National Neonatology Forum; 2020. Jan, [2023 Feb 20.
14. International Committee for the Classification of Retinopathy of Prematurity. The International Classification of Retinopathy of Prematurity revisited. *Arch Ophthalmol.* 2005;123:991–9.
15. Thylefors B. A global initiative for the elimination of avoidable blindness. *Am J Ophthalmol.* 1998;125:90–3.
16. Wheatley CM, Dickinson JL, Mackey DA, Craig JE, Sale MM. Retinopathy of prematurity: Recent advances in our understanding. *Arch Dis Child Fetal Neonatal Ed.* 2002;87:78–82
17. Good WV, Hardy RJ, Dobson V, Palmer EA, Phelps DL, et al. Early Treatment for Retinopathy of Prematurity Cooperative Group. Final visual acuity results in the early treatment for retinopathy of prematurity study. *Arch Ophthalmol.* 2010;128:663–71