ISSN: 0975-3583, 0976-2833 VOL14, ISSUE11, 2023

Original Research Article

TO SCREEN THE HIGH RISK TERM AND PRETERM BABIES FOR ROP

Dr. Priyanka Uraiya[1] (Senior Resident), Dr. Ritu Agrawal[2] (Junior Resident), Dr. Shreya Tripathi[3] (Junior Resident) & Dr. D K Shakya[4] (Professor)

Dept. of Ophthalmology, GRMC Gwalior[1,2,3&4]
Corresponding Author: Dr. Ritu Agrawal

Abstract

Background & Methods: The aim of the study is to screen the high risk term and preterm babies for ROP. The pupil were dilated with Mydriatic drop (tropicamide 1%+ phenylephrine 2.5%) instilled at 10 min interval about 1 hour before the scheduled examination, Baby shouldn't be fed immediately before the examination as the child may vomit or aspirate.

Results: Of the 200 cases screened 90 had a history of oxygen therapy, of these 33 (75%) in preterm & 51 screened 2 (4.54%) in term developed ROP. Out of 200 cases, considering poor postnatal weight gain in preterm 21(47.7%) out of 100 & in term 1(2.27%) out of 52 developed ROP. Out of 200 cases, 29 (65.9%) out of 120 cases in preterm & 1(2.27%) out of 29 in term developed ROP, considering phototherapy as a risk factor. Out of 200 cases, 14(31.8%) out of 40 in preterm &1(2.27%) out of 33 had history of Respiratory distress Syndrome (RDS), developed ROP. Of the 8 cases of multiple birth in this study were twins, and 5(11.3%) in preterm & 1(2.27%) out of 6 in term developed ROP.

Conclusion: The incidence of ROP is increasing due to increased survival of low-birth weight babies. Screening of high risk infants is essential to detect ROP. Incidence ROP in preterm – 30.0% (total sample of preterm 140) & in term – 3.33% (total sample of term 60). Birth weight > Lower gestational age > Duration of oxygen exposure > Respiratory distress > Phototherapy > Poor postnatal weight gain > Jaundice > IVH > Apnea > Anemia > BT > Sepsis > Twins.

Keywords: risk, term, preterm, babies & ROP.
Study Design: Prospective Observational Study.

1. Introduction

Retinopathy of prematurity (retinopathia praematurorum, ROP) is a disease of the eye, or specifically blood vessels of the retina and occurs only in premature children. For most of the children retinopathy of prematurity occurs in a mild form so it has spontaneous regression of the disease, unfortunately there may be more severe forms of ROP that cause blindness in one or both eyes.

The neonatal intensive care unit there is an increase in number of surviving preterm infants with very low birth weight, but at the same time, there is an increase in the incidence of retinopathy of prematurity, why more studies now deals with risk factors that influence ROP

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE11, 2023

occurrence and its prevention (1). The first changes in the eyes of the survived premature babies in terms fibrovascular bundles as retrolental fibroplasia, while the term retinopathy of prematurity was introduced by Heath in 1951 (2). Retinopathy of prematurity occurrence is usually associated with premature birth, but the risk for its occurrence represents a consequence of various factors interactive effects (3). Without any doubt it is proved that early gestational age (GA)≤30 weeks and low birth weight (BW)≤1500g are the most important risk factors in the development of ROP, but besides these significant impact also have other factors, such as poor weight gain, reduced IGF increase, the percentage of oxygen in the inhaled air (at first regarded not only as a risk but also directly causative factor for the ROP development), hypoxia, respiratory distress syndrome, twin pregnancy, anemia, blood transfusions, fungal infections, sepsis, intraventricular hemorrhage, etc. (4, 5). International Classification of Retinopathy of Prematurity (ICROP), implies the ROP monitoring according to 3 zones and 5 stages, while additional risk factors of ROP of progression are labeled as "plus disease", and the development of so-called aggressive ROP or AP-ROP (6).
Due to severe visual impairment and possible blindness, it is very important to start ROP screening on time in premature infants at risk, and the world's revised guidelines, the first initial review indicates a neonatologist at all children born before 31 weeks of GA or BW weight under 1500 grams during 3-4 weeks after birth. Premature infants at GA>31-32 weeks and BW>1500 grams, should be initially reviewed no later than 34 weeks. Also, a neonatologist indicates ophthalmological examination in premature infants of older gestational age if there are clinical risk factors for the ROP development. Further monitoring can be indicated by ophthalmologist according to maturity of retinal blood vessels (7).

2. Material and Methods

Present Study was conducted at Dept. of Ophthalmology, GRMC Gwalior, M.P. for 01 Year. Informed consent of parents were taken, Preparation for fundus examination, The pupil were dilated with Mydriatic drop (tropicamide 1%+ phenylephrine 2.5%) instilled at 10 min interval about 1 hour before the scheduled examination, Baby shouldn't be fed immediately before the examination as the child may vomit or aspirate. Follow up schedule is explained to parents. Follow up patients according to ROP follow up schedule. Laser by indirect ophthalmoscopy done when required.

Inclusion Criteria:

All term & preterm infants with:

- Low birth weight
- Oxygen exposure >30 days
- Antenatal h/o of steroids/NSAIDS
- Phototherapy exposure
- Erythropoietin in high doses
- Septicemia
- Lactic acidosis

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE11, 2023

3. Result

TABLE 1: SEX WISE DISTRIBUTION OF ROP

	HIGH RISK INFANTS SCREENED	ROP	
		NO. OF ROP	n/N
MALE	110	21	47.72%
FEMALE	90	23	52.27%

'n' : No of infants diagnosed as ROP in particular sex category.
'N': Total no of diagnosed ROP

TABLE 2: INCIDENCE OF ROP IN TERM AND PRETERM INFANTS

	TOTAL INFANTS SCREENED	ROP DEVELOPED	PERCENT
PRETERM	140	42	30%(42/140)
TERM	60	02	3.33%(2/60)
TOTAL	200	44	22%

TABLE 3: COMPARISON OF RISK FACTORS IN TERM AND PRETERM ROP

Risk factors	Preterm ROP			Term ROP		
	Exposed infants	No. Of infants develop ROP	n/N (%)	Exposed infants	No. Of infants develop ROP	n/N (%)
Twins	08	05	11.3%	06	01	2.27%
Placental insufficiency	11	03	6.81%	25	01	2.27%
Anaemia	81	18	40.9%	13	-	-
Oxygen exposure	90	33	75.0%	51	02	4.54%
Respiratory distress	40	14	31.8%	33	01	2.27%
Blood transfusion	28	09	20.4%	8	01	2.27%
Apnea	49	14	31.8%	17	-	-
Phototherapy	120	29	65.9%	29	01	2.27%
Sepsis	108	09	20.4%	32	02	4.54%
Poor postnatal weight gain	100	21	47.7%	52	01	2.27%
Steroids	09	02	4.54%	09	01	2.27%

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE11, 2023

IVH	45	19	43.1%	37	01	2.27%
Jaundice	50	18	40.9%	44	01	2.27%

Of the 200 cases screened 90 had a history of oxygen therapy, of these 33 (75%) in preterm & 51 screened 2 (4.54%) in term developed ROP. Out of 200 cases, considering poor postnatal weight gain in preterm 21(47.7%) out of 100 & in term 1(2.27%) out of 52 developed ROP. Out of 200 cases, 29 (65.9%) out of 120 cases in preterm & 1(2.27%) out of 29 in term developed ROP, considering phototherapy as a risk factor. Out of 200 cases, 14(31.8%) out of 40 in preterm &1(2.27%) out of 33 had history of Respiratory distress Syndrome (RDS), developed ROP. Of the 8 cases of multiple birth in this study were twins, and 5(11.3%) in preterm & 1(2.27%) out of 6 in term developed ROP.

4. Discussion

Thomas K. at all. in their study on 9187 children, found that 1163 (12.7%) infants developed severe ROP. Lower gestational age, male sex, small for gestational age, patent ductus arteriosus, late onset sepsis, more than two blood transfusions, use of inotropes and outborn statues were associated with an increased risk of severe ROP(8). Younger, smaller and sicker small infants had higher adjusted risks of severe ROP and rates varied significantly among sites. Enomoto H at all. found in clinical records of 143 newborn infants with a gestational age of 32 weeks or less were reviewed. Severe ROP was diagnosed when photocoagulation due to progression to stage 3 was identified or when ‘plus disease’ developed(9).

The factors were evaluated with univariate and multivariate logistic regression analyses between the groups with severe (n=24) and non-severe (n=119) ROP(10). Gestational age, birth weight, duration of oxygen supplementation, duration of directional positive air pressure and maximum fraction of inspiratory oxygen (FiO2) were significantly associated with severe ROP in the univariate analyses. In the multivariate analysis, a longer duration of oxygen supplementation and a higher maximum FiO2 were revealed as significant risk factors associated with severe ROP (11). Park SH at all. determined the incidence and clinical features and risk factors for retinopathy of prematurity in Korean infants with birth weight (BW)> 1500 g. A total of 201 consecutive infants with BW> 1500 g from January 2009 to December 2013 were included. The overall incidence of ROP was 11.94% and that of treatment-requiring ROP was 3.98%.

Two patients with gestational age (GA)> 32 weeks and BW>1500 g had treatment-requiring ROP. 15 eyes from eight infants with type I ROP required laser photocoagulation. The mean BWs and gas in the treatment-requiring ROP group were significantly lower than those in the no or mild ROP group(12). Total duration of oxygen supplementation, surfactant usage, respiratory distress syndrome, bronchopulmonary dysplasia, antibiotic use for more than 14 days and the number of ROPs associated risk factors significantly increased the likelihood of treatment- requiring ROP (13).

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE11, 2023

5. Conclusion

The incidence of ROP is increasing due to increased survival of low-birth weight babies. Screening of high risk infants is essential to detect ROP. Incidence ROP in preterm – 30.0% (total sample of preterm 140) & in term – 3.33% (total sample of term 60). Birth weight > Lower gestational age > Duration of oxygen exposure > Respiratory distress > Phototherapy > Poor postnatal weight gain > Jaundice > IVH > Apnea > Anemia > BT > Sepsis > Twins.

6. References

1. Ober RR, Palmer EA, Drack AV, Wright KW. Retinopathy of prematurity. Handbook of pediatric retinal disease, 2006; 10: 284-338.
2. Smith LEH. Pathogenesis of retinopathy of prematurity. Growth Hormone & IGF Research 2004. 14: 140-144.
3. Darlow BA, Hutchinson JL, Henderson-Smart DJ, Donoghue DA, Simpson JM, Evans NJ. Prenatal risk factors for severe retinopathy of prematurity among very preterm infants of the Australian and New Zealand Neonatal Network. Pediatrics. 2005; 115: 990-996.
4. Vatavuk Z, Benčić G, Andrijević Derk B, Mandić Z. Suvremeni pristup liječenju retinopatije nedonoščadi. Suvremeni dijagnostičko-terapijski postupci u oftalmologiji. Medix, listopad 2008; 78: 113-116.
5. Mutlu FM, Sadici SU. Treatment of retinopathy of prematurity: a review of conventional and promising new therapeutic option. Int J Ophthalmol. 2013; 6: 228-226.
6. Thomas K, Shah PS, Canning R, Harrison A, Lee SK, Dow KE. Retinopathy of prematurity: Risk factors and variability in Canadian neonatal intensive care units. J Neonatal Perinatal Med. 2015 Oct 24; 8(3): 207-214. doi: 10.3233/NPM-15814128.
7. Lorenz B, Spasovska K, Elflein H, Schneider N. Wide-field digital imaging based telemedicine for screening for acute retinopathy of prematurity (ROP). Six-year results of a multicentre field study. Graefes Arch Clin Exp Ophthalmol. 2009;247(9):1251–1262
8. Silva RA, Murakami Y, Lad EM, Moshfeghi DM. Stanford University network for diagnosis of retinopathy of prematurity (SUNDROP): 36-month experience with telemedicine screening. Ophthalmic Surg Lasers Imaging. 2011;42(1):12–19
9. Chiang MF, Wang L, Busuioc M, et al. Telemedical retinopathy of prematurity diagnosis: accuracy, reliability, and image quality. Arch Ophthalmol. 2007;125(11):1531–1538
10. Scott KE, Kim DY, Wang L, et al. Telemedical diagnosis of retinopathy of prematurity intraphysician agreement between ophthalmoscopic examination and image-based interpretation [published online ahead of print May 23, 2008]. Ophthalmology. doi:10.1016/j.ophtha. 2007.09.006
11. Good WV, Hardy RJ, Dobson V, 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(6):663–671

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE11, 2023

12. Mintz-Hittner HA, Kennedy KA, Chuang AZ; BEAT-ROP Cooperative Group. Efficacy of intravitreal bevacizumab for stage 3+ retinopathy of prematurity. N Engl J Med. 2011; 364(7):603–615
13. Section on Ophthalmology American Academy of Pediatrics; American Academy of Ophthalmology; American Association for Pediatric Ophthalmology and Strabismus. Screening examination of premature infants for retinopathy of prematurity. Pediatrics. 2006;117(2):572–576