IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 19, Issue 8 Ser.2 (August. 2020), PP 21-24
www.iosrjournals.org

Incidence and risk factors of Retinopathy of prematurity in a rural based tertiary care centre.

[1]Dr Munshi Safikul Islam,[2]Dr Syama Prasad Sit
[1]*ex-post graduate trainee(MD),dept of pediatrics,B.S.M.C.H*
[2]*associate professor,department of pediatrics,B.S.M.C.H*
Correspondence-dr munshi safikul islam

Abstract:-background: *Retinopathy of prematurity is an important cause of preventable blindness among preterm and low birth weight infants,the study aims to find incidence and risk factors of ROP in a rural based tertiary centre****.methodology:****The study was done at BSMCH,a rural based tertiary care among 244 newborns with birth weight <2000gms or <34wk of GA,baby with ≥2000gms of birth weight or ≥34wks of GA was screened only if they had additional risk factors. Univariate logistic regression was used to identify the risk factors for ROP****.results:****The incidence of ROP among 244 newborn screened was found to be 12.7%,6.4% of the patients with GA≥34 wk had ROP but no patient above 2000gms of birth weight was found to have ROP.Apnoea,sepsis,oxygen therapy,low birth weight and ET were associated with increased risk for ROP****.Conclusions:****ROP is important cause of preventable blindness in children,among many risk factors, gestational age and birthweight found to be greatest risk factors****.keywords-ROP,GA,birth weight,NICU,SNCU,ET(exchange transfusion)***

Date of Submission: 18-07-2020 Date of Acceptance: 02-08-2020

I. Introduction

Described in 1942,Retinopathy of prematurity is a vasoproliferative disorder of abnormal retinal vessels in preterm infants. It is one of the leading causes of preventable blindness in children, particularly in middle-income countries [1] where the 'third epidemic' of blindness from ROP is said to be occurring [2], with a wide spectrum, ranging from mild, transient changes in the retina with regression to severe progressive vasoproliferation, scarring, detachment of retina and blindness:If identified early, it can be treated successfully.The International Classification of Retinopathy of Prematurity (ICROP) was instrumental in establishing the standards and nomenclature for the clinical assessment of ROP based on the anatomical location (zone) and severity (stage) of disease [3].Stage-1 having a faint demarcation line,Stage-2 having ridge in the demarcation line,Stage-3 having Extra retinal Fibrovascular proliferation,Stage-4 is partial retinal detachment,Stage-5 is complete retinal detachment. Plus disease includes significant vascular dilation and tortuosity of posterior fundus and it signifies severity of the disease.[4]Though initially intensive oxygen therapy was implicated as the main causative agent, now a days reports have found that different developmental,environmental factors also play important role in pathogenesis.[5]The aim of this prospective study was to find out the incidence of ROP in a tertiary care centre based in a rural area of West Bengal,India.It also attempts to identify the risk factors which predispose to ROP in neonates admitted in Neonatal Intensive Care Unit (NICU) and SNCU of B.S.M.C.H.

II. Materials And Methods

Study design: A hospital based Prospective study.
Study area: The prospective study was conducted in NICU,SNCU of B.S.M.C.H in cooperation between Dept. of paediatrics and ophthalmology.
Study period: The study was conducted between june 2018 to may 2019.
Sample size-Total 244 newborn were screened during the study period.
Study population: The study population included 244 neonates and studied for 1 year. The initial examination was carried out at 4 weeks after birth or 31 to 33 weeks of post-conceptional age, whichever was later.Early screening at 2-3wk of life was done in case of birth weight <1200gms or gestational age <28 wk.
Screening criteria:inclusing criteria: All neonates (both inborn and outborn) with gestational age <34 weeks or birth age <2000gms, neonates with gestational age more than 34 weeks or birth weight more than 2000gms were included if associated with following: apnea,mechanical ventilation or CPAP of any duration,oxygen therapy of >24

hours,culture positive sepsis,blood products transfusion.[6] Informed consent of the parents were obtained.**exclusion criteria**- Babies born at >34 weeks of gestational age and >2000 grams without risk factors, Patients/Guardians not willing to enrol for study, Newborns at risk for developing cortical blindness (like those with structural brain lesions).A detailed history including birthweight, gestational age at birth, weight for gestation (AGA / SGA status) & problems during NICU and SNCU stay and its management were recorded.
Clinical Examination:-weight,length,head circumference,gestational age using new Ballard Score,vital signs,neonatal reflexes,cardiological,respiratory,circulatory,neurological manifestations.
Statistical analysis:-Descriptive statistics included percentage of different categories for categorical values and mean and standard deviation for numerical variables.Univariate analysis was conducted using Chi square test/Fisher exact test for categorical variables.A probability of (p)<0.05 was considered statistically significant.

III. Results

Two hundred and forty four neonates were examined for 1 year. Their birthweight ranged from 950-2010g with a mean of 1225±235gms. The gestational age ranged from 26-37 weeks with a mean of 31.4±2.2 weeks.There were 146 male and 98 female.ROP was seen among 31 neonates in one or both eyes,overall incidence was 12.7%.The incidence of ROP with gestational age is shown in Fig.1.As the gestational age decreases ,incidence of ROP increases**(p<0.05)**

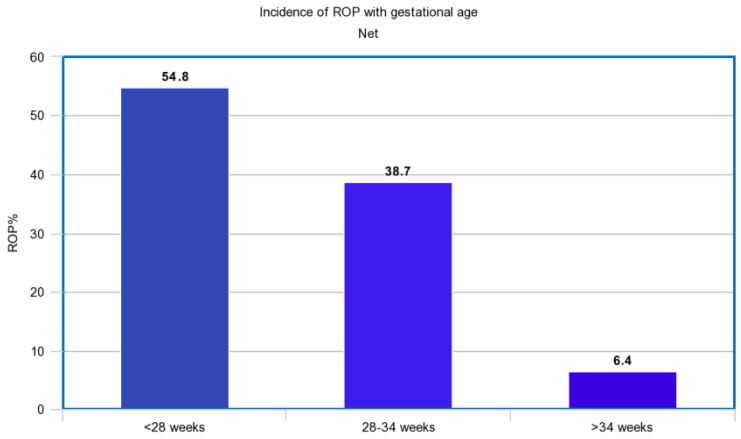

fig.1*-bar diagram showing increased incidence of ROP with decreasing gestational age.*

Table 1: shows the relationship between ROP and various risk factors.

Factors	*ROP + n=31*	*ROP- n=213*	*P value (95%Cl)*
Birth weight	*<1200g=11* *1201-1500g=14* *1501-1999g=6* *>2000g=0*	*13* *114* *25* *3*	***P<o.ooo1***
Apnea n=123	*21*	*102*	***0.038***
O_2 therapy>24 hrs, n=85	*22*	*63*	***<0.00001***
Ventilation n=21	*5*	*16*	*1.0996*
CPAP n=33	*6*	*27*	*0.3096*
Sepsis n=120	*23*	*97*	***<0.00286***
PDA n=3	*1*	*2*	*0.2803*
Hyperbilirubinaemia n=140	*17*	*123*	*0.7596*
E.T. n=23	*9*	*14*	***<0.000064***
Phototherapy n=117	*14*	*103*	*0.7393*
IVH n=11	*2*	*9*	*0.5767*

Above mentioned table shows the relationship between ROP and various risk factors.The prenatal variables were gestational age,birth weight,gender and mode of delivery,The post natal variables were apnoea,O_2 therapy,CPAP,mechanical ventilation,sepsis,hyperbilirubinaemia, intraventricular haemorrhage,patent ductus arteriosus,exchange transfusion. A univariate analysis was done taking each risk factors.Among them, birth weight,gestational age,apnea (p =0.038),O_2 therapy(p<0.00001),sepsis(p<0.00286),exchange transfusion(p<0.001) found statistically significant.Among the affected neonates;Stage 1 ROP was seen in 18 neonates (56.6%),Stage 2 was ROP seen in 9 neonates (30.4%),Stage 3 was in 4 neonates(13%).No Stage 4 & 5 ROP seen among affected neonates.Plus Disease seen in 3 neonates(9.6%).

IV. Discussion

Despite and partly due to major advances in neonatology, ROP remains a leading cause of lifelong visual impairment among children in developing countries.The incidence in our study was 12.7%,which was less than that reported in many other studies in India:chowdhury et al [9] study found incidence of 22.6%, according to Anudeep et al [10] study incidence was 36.9%,however it was higher than the study done in Beijing[11] which showed result of 10.8%. We screened all babies admitted to our NICU and SNCU with birthweight <2000gms and gestation age less than 34 weeks. Infants with birthweight ≥2000gms and gestational age more than 34 weeks were screened only if they had additional risk factors. Maheshwari, et al[12] screened all babies weighing <1500gms with a gestational age<35 weeks. Gupta et al.[13]screened all babies ≤1500gms of birth weight and/or gestational age ≤35 weeks.Incidence and severity of ROP Reported by Palmer et al [14], was closely related to lower birthweight and lower postconceptional age, as it was seen in our study.Anudeep et al[10] also found most important risk factor to be low birth weight,followed by duration of oxygen therapy and low GA.This was explained by immaturity of vascularisation which increases susceptibility of retina to oxidative damage.In our study, oxygen administration, septicemia, apnea were found to be significant risk factors. Vinekar et al[15] also found that septicemia was a significant risk factor. Aggarwal et al [16] found apnea, clinical sepsis and male gender to be significant risk factors.Shah et al [17] & Hakeem et al [18] also found same corelationship,but Palmer et al [14] reported that oxygen therapy was a insignificant factor for occurance of ROP in their study.Though we found exchange transfusion was an independent risk factor ,& correlated with Hakeem et al, Hirano et al stated that the factor is controversial. Other risk Factors viz. PDA ,IVH ,hyperbilirubinaemia ,phototherapy ,CPAP, mechanical ventilation showed insignificant($p>0.05$) relationship with occurance of ROP which can be correlated with other studies.[9,10,18]

V. Conclusion

Visual impairment due ROP may be avoided by early diagnosis and treatment,so timely screening of the baby at risk is important.All newborns <2000 grams and <34 weeks should be screened irrespective of risk factors. Early screening is advised in VLBW and ELBW newborns because ROP tends to be asymptomatic in the early stages followed by a fulminant course later in these newborns. standards of practice now demand carefully timed retinal examination of at risk infants for ROP by an ophthalmologist experienced in the examination of the retina, to minimize the risks of visual loss by these infants. Pulse oximeters and blended oxygen should be used in delivery rooms and neonatal units to guide oxygen therapy. All babies who receive oxygen should be monitored closely so that the duration will be minimal,avoiding unnecessary exposure to oxygen.**Limitation**: The study was performed in relatively small no. of babies. hence, the findings cannot readily be generalized and correlated with other significant studies.

References

[1]. Gilbert C, Rahi J, Eckstein M, O'Sullivan J, Foster A.Retinopathy of prematurity in middle-income countries.Lancet. 1997;350:12-4.

[2]. Blencowe H, Lawn JE, Vazquez T, Fielder A, Gilbert C. Preterm-associated visual impairment and estimates of retinopathy of prematurity at regional and global levels for 2010. Pediatr Res. 2013;74 Suppl 1:35-49

[3]. An international classification of retinopathy of prematurity. The Committee for the Classification of Retinopathy of Prematurity. Arch Ophthalmol 1984;102:1130–4.

[4]. John F.salmon.Kanski's clinical ophthalmology a systematic approach,9th Ed,2020:538

[5]. Hammer ME, Mullen PW, Fergusson JG, Poi S, Cosbox C. Jackson KL. Logistic analysis of risk factors in acute retinopathy of prematurity. Am J Ophthalmol 1986; 102: 1-6.

[6]. AIIMS protocol in neonatology 2014:395-396

[7]. International Committee for the Classification of the Late Stages of Retinopathy of Prematurity. An international classification of retinopathy of prematurity II. The classification of retinal detachment. Arch Ophthalmol 1987; 105: 906-912.

[8]. John F.salmon.Kanski's clinical ophthalmology a systematic approach,9th Ed,2020:538-539

[9]. Chaudhari S,Patwardhan s,Vaidya U, Retinopathy of Prematurity in a Tertiary Care Center –Incidence, Risk Factors and Outcome,Indian Pediatr.2009;46,219-24

[10]. Anudeep k,Srikanth k,Sindal MD,Jha KN.Study of incidence,risk factors and treatment outcomes in retinopathy of prematurity in a tertiary care center.TNOA J Ophthalmic Sci Res 2019:57:24-6

[11]. Chen y,Li X-x,Yin H,gilbert c,Liang JH,Jiang YR et al. risk factors for retinopathy of prematurity in six neonatal intensive care units in Beijijng ,China.Br J Ophthalmol.2008;92:326-30

[12]. Maheshwasri R, Kumar H, Paul VK, Singh M, Deorari AK, Tiwari AK. Incidence and risk factors of retinopathy of prematurity in a tertiary newborn unit in New Delhi. Natl Med J India 1996; 92: 211-214.

[13]. Gupta VP, Dhaliwal U, Sharma R, Gupta P, Rohtagi J. Retinopathy of prematurity – risk factors. Indian J Pediatr 2004; 71: 887-892.

[14]. Palmer EA, Flynn JT, Hardy RJ, Phelps DL, Phillips CL, Schaffer DB, et al. Incidence and early course of retinopathy of prematurity. Ophthalmology 1991; 98: 1628-1640.

[15]. Vinekar A, Dogra M, Sangtam T, Narang A, Gupta A. Retinopathy of prematurity in Asian Indian babies weighing greater than 1250 grams at birth: ten year data from a tertiary care center in a developing country. Indian J Ophthalmol 2007; 55: 331-336.

[16]. Aggarwal R, Deorari AK, Azad RV, Kumar H, Talwar D, Sethi AI. Changing profile of retinopathy of prematurity. Trop Pediatr 2002; 48: 239-242

[17]. .Shah VA,Yeo CL,Ling YL, incidence,risk factors for retinopathy of prematurity among very low brth weight infants in Singapore,Ann Acad Med Singapore.2005;34:169-78
[18]. Hakeem A,Mohamed G,Othman M, Retinopathy of prematurity:A study of prevalence and risk factors.Middle East Afr J Ophhalmol.2012 Jul-Sep;19(3):289-294

Acknowledgement

We are indebted to entire ophthalmology department, B.S.M.C.H for their active support. It is my proud privilege to express my deep sense of gratitude to faculties,nursing staff ,group-D staff, my friends and collegues of B.S medical college,dept of pediatric medicine for their guidance and support for doing this research work.

Dr Munshi Safikul Islam, et. al. "Incidence and risk factors of Retinopathy of prematurity in a rural based tertiary care centre." IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), 19(8), 2020, pp. 21-24.