Screening Of Retinopathy Of Prematurity – Using Indirect Ophthalmoscope And Retcam : A Prospective Observational Study

Dr. Hardika B. Sathvara*, Dr. Nilesh V. Parekh **, Dr. Alpa N. Parekh***

*3Rd Year Resident Doctor, **Professor And Head Of Department Of Ophthalmology, ***Associate Professor Of Department Of Paediatrics, Department Of Ophthalmology, Sir Takhthasinhji Hospital, Bhavnagar 364001, Gujarat, India

Abstract: Background: Aim And Objectives: To study the incidence of Retinopathy of Prematurity in Low birth weight Neonates and Preterm who are at high risk, by screening with Binocular Indirect Ophthalmoscope and Ret Cam 3 resulting in early diagnosis and further management of disease will prevent blindness and other complications in children due to ROP. Material And Methods: Prospective Observational study included 60 Newborns (25 female,35 male) with GA <34 weeks and/or birth weight <1750 grams, and GA 34-36 weeks and/or birth weight 1750-2000 grams with risk factor, screened with First Binocular Indirect Ophthalmoscope and then after 30 minutes with Ret Cam 3. Result: Both the techniques are equally effective in detection and staging of Retinopathy of Prematurity screening. Conclusion: Both techniques give satisfactory results for screening of Retinopathy of Prematurity and are comparable to each other, both having their own pros and cons. [Sathvara H Natl J Integr Res Med, 2021; 12(6): , 109-111]

Key Words: Binocular Indirect Ophthalmoscope, Low Birth Weight, Preterm, Ret Cam 3, Retinopathy Of Prematurity, Screening

Author for correspondence: Dr. Hardika Sathvara, 3Rd Year Resident Doctor, Department Of Ophthalmology, Sir Takhtha Sinhji Hospital, Bhavnagar 364001, Gujarat, India
E-Mail: hardikasathvara09@gmail.com

Introduction: Retinopathy of prematurity (ROP) is a disease of premature infants and a leading worldwide cause of preventable childhood blindness[1]. The first case of ROP, known as Retrolental fibroplasia (RLF), was identified in 1942 by Terry in Boston in February[2]. However, RLF is currently applied to describe later stage cicatricial (severe retinal scarring) disease with retinal detachment and formation of Retrolental fibroplastic membrane. Retinopathy Of Prematurity is contributing to about 40% of childhood visual impairement[3,4]. ROP is one of the few preventable causes of childhood visual impairment[5]. Early identification and treatment prevent blindness and offer the affected child better visual development[6].

Material & Methods: This is a prospective, hospital based, Observational Study for screening purpose of preterm and low birth weight Newborn attending Ophthalmology Out Patient Department. Duration of study From July 2019 to June 2020.

After getting ethical approval from institutional review board in October 2018 and written informed consent from each Newborn parents/ guardian, we enrolled 60 Newborns for screening purpose advised by neonatologist, in OPD basis screening protocol. We included 1) Newborn of gestational age < 34 weeks or birth weight < / = 1750 grams. 2) Any Newborn of gestational age between 34 to 36 weeks or Birth weight between 1750 to 2000 grams with Risk factors (Apnoea, Sepsis, Anaemia, Multiple gestation, Cardiac defects, multiple blood transfusion, Respiratory distress syndrome). And excluded Newborn having other congenital Anomalies of eye or body and whose parents / guardian not giving written and informed consent.

Newborn history is taken according to Birth weight, Gestational age; Oxygen exposure associated other Risk factor (Apnoea, Sepsis, Anaemia, Multiple gestations, Cardiac defects, multiple blood transfusion, and Respiratory distress syndrome), Family history.

External Examination of Eye including orbit, globe, eyelashes, lacrimal sacs, conjunctiva, sclera and Anterior segment examination done with torch light and pupillary reactions were noted. The Neonates were examined without sedation. The pupils were adequately dilated with diluted tropicamide (0.4% tropicamide+ 2.5% phenylephrine) instilled thrice every 5 minutes in both eyes. Excess eyedrops were wiped away each time.Then examination done

with Binocular Indirect Ophthalmoscope in all Retinal quadrants and finding were noted. After 30 minutes examination done with Ret cam 3.

Photographs were taken in all peripheral quadrants in both eyes successively.

Brief findings were recorded to use of a Standardized form using the ICROP (International classification of Retinopathy of Prematurity) and Provided to parent with clear instructions to adhere strictly to follow up.

Results: Data analysis was performed in GraphPad instat software (version 3.06).

Data was analysed as percentage wherever required.

In our study, 20 (33.33%) Newborn were ROP positive, 40 (66.66%) Newborn were normal.

There were 12 (34.28%) male newborn and 8 (32%) female newborn ROP positive.

Table 1: ROP Positive (Zone, Stage, Plus Disease)

ROP Positive (Zone, Stage, Plus Disease)	Total No.
Zone 1 Stage 2	2
Zone 1 Stage 5	1
Zone 1 Stage 3	2
Zone 2 Stage 2	3
Zone 2 Stage 3	2
Zone 2 Avascular	2
Avascular Zone	1
Zone 3 Avascular	1
Zone 3 Stage 1	4
Zone 3 Stage 2	1
Plus Disease	1

Discussion: ROP screening with 1st Heines Binocular Indirect Ophthalmoscope, after that with RET-CAM 3 on total 60 newborn patient, in which total 20 (12 male, 8 female) newborn patient having ROP with both the instrument showing same result (sensitivity 100%, specificity 100%), included 2 newborn has zone 2 stage 2, zone 1 stage 5 having 1 newborn, zone 1 stage 3 having 2 newborn, zone 2 stage 2 having 3 newborn, zone 2 stage 3 having 2 newborn, zone 2 avascular 2, avascular zone having 1 newborn, zone 3 avascular having 1 newborn, zone 3 stage 1 having 4 newborn, zone 3 stage 2 having 1 newborn, 1 newborn had plus disease (which was treated with injection accentrix). On correlating the data in our study, Gender did not affect the number of newborn with ROP.

Gestational age, birth weight and Newborn with oxygen exposure wise distribution show statistic significance with ROP.

Hence in our study, both the techniques are equally effective in detection and staging of Retinopathy of Prematurity screening.

Conclusion: In our study, ROP screening was done with both the techniques Binocular indirect ophthalmoscope and RET-CAM 3.

BIO technique had advantage of better visulisation of Fundus details but it had Technical difficulty and Time constraints, and also scleral depression required during BIO examination may cause bradycardia, vitreous and subretinal hemorrhages.

The advantage in RetCam 3 was that, infants experience less pain and stress compared to BIO examination, and provides more accurate Documentation and photographic reference, but it had difficulty to recognize most anterior peripheral disease.

Thus both techniques give satisfactory results and are comparable to each other, both having their own pros and cons.

References:

1. Gilbert C, Foster A. Childhood blindness in the context of VISION 2020: the right to sight. Bulletin of the World Health Organization. 2001;79:227-32
2. Tl T. Extreme prematurity and fibroblastic overgrowth of persistent vascular sheath behind each crystalline lens. Am J Ophthalmol. 1942;25:203-4.
3. Quinn GE. Retinopathy of prematurity blindness worldwide: phenotypes in the third epidemic. Eye and brain. 2016;8:31.
4. Gilbert C, Fielder A, Gordillo L, Quinn G, Semiglia R, Visintin P, Zin A. Characteristics of infants with severe retinopathy of prematurity in countries with low, moderate, and high levels of development: implications for screening programs. Pediatrics. 2005 May 1;115(5):e518-25.

5. Fanaroff AA, Martin RJ. Neonatal-perinatal medicine volume one. Mosby; 2002.
6. Hartnett ME, Penn JS. Mechanisms and management of retinopathy of prematurity. New England Journal of Medicine. 2012 Dec 27;367(26):2515-26.

Conflict of interest: None
Funding: None
Cite this Article as: Sathvara H, Parekh N, Parekh A. Screening Of Retinopathy Of Prematurity – Using Indirect Ophthalmoscope And Retcam: A Prospective Observational Study. Natl J Integr Res Med 2021; Vol.12(6): 109-111