



FREQUENCY OF RETINOPATHY IN LOW BIRTH WEIGHT INFANT AT TERTIARY CARE HOSPITAL.

Muhammad Younis Tahir¹, Iftikhar Ahmad², Soufia Farrukh³

1. MBBS, MCPS, FCPS
Associate Professor of
Ophthalmology
Quaid-e-Azam Medical College/
Bahawal Victoria Hospital
Bahawalpur.
2. MBBS, DCH, FCPS
Senior Registrar of Pediatrics
Quaid-e-Azam Medical College/
Bahawal Victoria Hospital
Bahawalpur.
3. MBBS, DOMS, FCPS, FRCS
Professor of Ophthalmology
Quaid-e-Azam Medical College/
Bahawal Victoria Hospital
Bahawalpur.

Correspondence Address:
Dr. Muhammad Younis Tahir
Department of Ophthalmology
Quaid-e-Azam Medical College/
Bahawal Victoria Hospital Bahawalpur.
doctoryounis@gmail.com

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ABSTRACT... Objectives: To find out the frequency of retinopathy in low birth weight infant presenting at tertiary care hospital, Bahawalpur. **Study Design:** Cross sectional study. **Setting:** Department of Ophthalmology, Bahawal Victoria Hospital, Bahawalpur. **Period:** July 2018 to December 2018. **Material & Methods:** Neonatal eye examination was performed for ROP. **Results:** Total 78 neonates were recruited for present study and ROP was assessed. Mean gestational age of neonates was 32.54 ± 3.79 weeks. Mean weight was 1445.51 ± 517.373 grams. Out of 78 neonates, ROP was observed in 28 (36%) neonates. ROP was found in 27 (42.19%) neonates of premature group and in 1 (7.14%) neonates of at term group. ROP was found in 1 (3.23%), 5 (29.41%) and 22 (73.33%) neonates respectively in weight group 1500-2500 g, 1000-1500 g and <1000 g group. Male neonates were 35 (44.87%) and female neonates were 43 (55.13%). Development of ROP was not significantly ($P = 0.248$) associated with gender of the neonates. Statistically significant association between ROP and oxygen supplementation was observed with p value 0.021. **Conclusion:** Results showed higher association of development of ROP with gestational age. Oxygen supplementation and oxygen concentration was also associated with development of ROP. Findings also showed no effect of gender and duration of hospital stay on ROP.

Key words: Birth Weight, Oxygen Supplementation, Prematurity, Retinopathy.

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INTRODUCTION

In 1942 Terry described a vasoproliferative disorder which occurs in the retina of premature infants known as retinopathy of prematurity (ROP).¹ There are 1.4 million blind children worldwide (2/3 in developing countries), estimated by WHO. In approximately 50000 children, ROP was the cause of blindness.² To reduce such ROP incidence, proper management is required for very low birth weight (VLBW) infants.³ The frequency of ROP in infants has increased due to improved survival rate of infants during the last 10 years. Developed countries have significantly less ROP cases than developing countries.⁴

High premature births, lack of awareness and skilled people or financial constraints with the lack of screening and treatment in most neonatal units are causing more ROP incidence.⁵ Majorly gestational age (GA) and birth weight (BW) are the risk factors of ROP. Infants at risk should

be examined by ophthalmologist and studies has given effective ROP screening programs in developed countries.⁶ It was thought, the contributory factors for developing ROP were immaturity and higher levels of oxygen.⁷ But even after long duration of oxygen with Supplementation of oxygen, not all infants developed ROP. Factors like male sex, maternal hypertension, respiratory distress syndrome, apnea, sepsis, genetic factors, multiple births, blood transfusions and intraventricular hemorrhage are involved in ROP.⁸

MATERIAL AND METHODS

This cross sectional study was conducted at Department of Ophthalmology, Bahawal Victoria Hospital, Bahawalpur from July 2018 to December 2018.

In this study total 78 neonates of both gender having weight 800-2500 gram, having gestational age 28-40 weeks were selected. Patients with

congenital cataract, patients with congenital malformation, patients with chromosomal anomalies and patients with tumor of eyes were excluded from the study.

Digital weighing machine was used for weight. Estimation of gestational age was done by maternal history and by abdomen ultrasound.

All the selected patients were examined for ROP. Before eye examination, pupils were dilated by instilling topical 0.5% cyclopentolate and 0.5% phenylephrine eye drops 3 times (one minute apart). Indirect ophthalmoscopy was performed using a binocular indirect ophthalmoscope. Lid speculum and scleral depressors were used routinely. The diagnosis of ROP was made based on the amount of abnormal blood vessel development. Findings were noted on predesigned proforma in term of ROP Yes/No.

SPSS version was used to analyzed the data. Continuous variables was presented as mean and SD and categorical variables were presented as frequency and percentage. Chi-square test used to assess the association of ROP with different variables. P-value ≤ 0.05 was considered statistically significant.

RESULTS

Total 78 neonates were recruited for present study and ROP was assessed. Out of 78 neonates, ROP was observed in 28 (36%) neonates. (Figure-1)

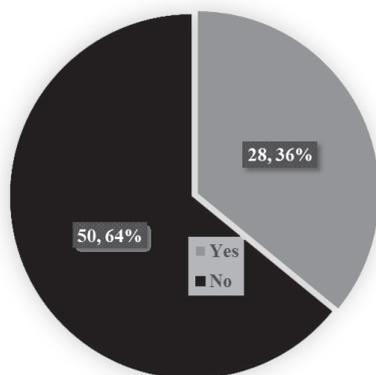


Figure-1. Frequency of ROP

Mean gestational age of neonates was 32.54 ± 3.79 weeks. Selected neonates were divided

into premature group and at term group. Total 64 (82.05%) neonates belonged to premature group and 14 (17.95%) neonates belonged to at term group. ROP was found in 27 (42.19%) neonates of premature group and in 1 (7.14%) neonate of at term group. Significantly ($P = 0.013$) higher rate of ROP was observed in premature group as compared to at term group. (Table-I).

Mean weight was 1445.51 ± 517.373 grams. Neonates were divided into three weight categories i.e. 1500-2500 g, 1000-1500 g and <1000 g. Total 31 (39.74%) neonates were between 1500-2500 g, 17 (21.79%) neonates were between 1000-1500 g and 30 (38.46%) neonates were <1000 g. ROP was found in 1 (3.23%), 5 (29.41%) and 22 (73.33%) neonates respectively in weight group 1500-2500 g, 1000-1500 g and <1000 g group. Development of ROP was significantly ($P = 0.000$) associated with weight of the neonates. (Table-II).

Male neonates were 35 (44.87%) and female neonates were 43 (55.13%). ROP was found in 15 (42.86%) male neonates and in 13 (30.23%) female neonates. Development of ROP was not significantly ($P = 0.248$) associated with gender of the neonates. (Table-III).

Mean duration of oxygen supplementation was 10.29 ± 5.822 hours. In 33 (42.31) neonates, duration of oxygen supplementation was <12 hours and in 45 (57.69) neonates was ≥ 12 hours. ROP was develop in 7 (21.21) neonates of <12 hours group and in 21 (46.67) neonates of ≥ 12 hours group. (Table-IV).

Selected neonates were divided into two groups according to Oxygen concentration i.e. $\leq 60\%$ group and $>60\%$ group. Out of 21 (26.92%) neonates of $\leq 60\%$ group, ROP was found in 9 (42.86%) neonates. Total 57 (73.08%) neonates belonged to $>60\%$ group, ROP was observed in 19 (33.33%) neonates. Statistically insignificant association between oxygen concentration and development of ROP was noted with p value 0.437. (Table-V).

Duration of hospital stay of 52 (66.67%) neonates and 26 (33.33%) neonates were between 1-15

days and 16-30 days respectively. ROP was noted in 14 (26.92) neonates and 14 (53.85%) neonates respectively in 1-15 days group and 16-30 days

group. Statistically insignificant association between ROP and duration of hospital stay was noted with p value 0.384. (Table-VI).

Gestation	ROP		Total	P-Value
	Yes (%)	No (%)		
Premature	27 (42.19)	37 (57.81)	64 (82.05)	0.013
Term	1 (7.14)	13 (92.86)	14 (17.95)	
Total	28 (36)	50 (64)	78	

Table-I. Association of ROP with gestation.

Oxygen Concentration	ROP		Total	P-Value
	Yes (%)	No (%)		
1500-2500	1 (3.23%)	30	31 (39.74)	0.000
1000-1500	5 (29.41%)	12	17 (21.79)	
<1000	22 (73.33%)	8	30 (38.46)	
Total	28 (36)	50 (64)	78	

Table-II. Association of ROP with oxygen concentration.

Gender	ROP		Total (%)	P-Value
	Yes (%)	No (%)		
Male	15 (42.86)	20 (57.14)	35 (44.87)	0.248
Female	13 (30.23)	30 (69.77)	43 (55.13)	
Total	28 (36)	50 (64)	78	

Table-III. Association of ROP with gender.

Oxygen Supplementation (Hours)	ROP		Total (%)	P-Value
	Yes (%)	No (%)		
<12	7 (21.21)	26 (78.79)	33 (42.31)	0.021
≥12	21 (46.67)	24 (53.33)	45 (57.69)	
Total	28 (36)	50 (64)	78	

Table-IV. Association of ROP with Duration of oxygen supplementation.

Oxygen Concentration	ROP		Total (%)	P-Value
	Yes (%)	No (%)		
≤60%	9 (42.86)	12 (57.14)	21 (26.92)	0.437
>60%	19 (33.33)	38 (66.67)	57 (73.08)	
Total	28 (36)	50 (64)	78	

Table-V. Association of ROP with oxygen concentration.

Duration of Hospital Stay (Hours)	ROP		Total (%)	P-Value
	Yes (%)	No (%)		
1-15	14 (26.92)	38 (73.08)	52 (66.67)	0.384
16-30	14 (53.85%)	12 (46.15%)	26 (33.33)	
Total	28 (36)	50 (64)	78	

Table-VI. Association of ROP with duration of hospital stay.

DISCUSSION

ROP is one of the most fatal complications developed in neonates. Embryonic retinal arteries grow from the end of 1st trimester till birth. Visual disorders are led by fragile vessels which occurs due to inhibited or unusual growth of eye.⁹ Even after availability of progressed treatment, ROP is still extensively becoming the cause for visual disorders in developed countries.¹⁰ Late diagnosis of disease can cause blindness but it can be prevented by timely recognition of disease.¹¹ It can develop during the 32nd week of gestation (preterm delivery) and also due to birth weight being <1500g.

ROP risk factors includes heart disease, infection, apnea, respiratory disorders, intraventricular hemorrhage, decreased PH, bradycardia, decreased blood O₂, vitamin E deficiency, transfusion, increased oxygen (O₂) consumption, increased blood carbon dioxide, duration of ventilation, amount of received oxygen and various maternal factors (preeclampsia, diabetes, mother's smoking).^{12,13}

The purpose of present study was to evaluate the frequency of ROP in neonates admitted in Paediatric wards of Bahawal Victoria Hospital, Bahawalpur.

Total 78 neonates were recruited for present study and ROP was assessed. Out of 78 neonates, ROP was observed in 28 (36%) neonates, mean gestational age of neonates was 32.54 ± 3.79 weeks and Mean weight was 1445.51 ± 517.373 grams.

In a study by Adio et al¹⁴, mean gestational and mean birth weight of neonates was 28.98 ± 1.38 weeks and 1411 ± 128 gram. In this study over all prevalence of ROP was 47.2% which is higher than our findings. In USA and Europe, ROP incidence is between 10-34%.¹⁵ In one study conducted in China, frequency of ROP was 26% which is comparable with our study.¹⁶

In another study by Shah et al¹⁷, reported frequency of ROP was 29.2% which is also comparable with our study. Taqui et al¹⁸ reported

frequency of ROP in 32.4% neonates. Neonates were divided into three weight categories i.e. 1500-2500 g, 1000-1500 g and <1000 g. total 31 (39.74%) neonates were between 1500-2500 g, 17 (21.79%) neonates were between 1000-1500 g and 30 (38.46%) neonates were <1000 g. ROP was found in 1 (3.23%), 5 (29.41%) and 22 (73.33%) neonates respectively in weight group 1500-2500 g, 1000-1500 g and <1000 g group. Development of ROP was significantly ($P = 0.000$) associated with weight of the neonates.

Selected neonates were divided into premature group and at term group. Total 64 (82.05%) neonates belonged to premature group and 14 (17.95%) neonates belonged to at term group. ROP was found in 27 (42.19%) neonates of premature group and in 1 (7.14%) neonates of at term group. Significantly ($P = 0.013$) higher rate of ROP was observed in premature group as compared to at term group.

Lermann et al¹⁹, also reported comparable (27.2%) results in their study. Retinopathy of prematurity was confirmed in 50% of the patients with weights below 1,000 g and 71.5% of newborn infants born at gestational ages of less than 28 weeks. Reisner et al²⁰ examined 1070 newborns and found 20% of them with ROP <2500g, 21% weighing <1500g, 35% <1250g and 72% were <1000 gram. Reisner et al²⁰ studied 1,070 newborn infants, observing a 20% prevalence of ROP among newborn infants weighing less than 2,500 g, 21% for those below 1,500 g, 35% for weights under 1,250 g and 72% for babies born weighing less than 1,000 g. Threshold disease was found in 9% of the newborn infants with weights below 1,500 g.

Charles et al found ROP in 72% neonates having weight <1200g and 66% newborn having gestational age <32 weeks.²¹ Purohit et al examined 3025 newborn for ROP and found ROP in 11% newborn having weight <1750g and in 43% having birth weight <750g.²² Hussain et al²³ and Larsson et al²⁴ reported frequency of ROP as 21.3% and 25.5% respectively.

CONCLUSION

Results showed development of ROP with

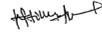
gestational age was highly significant. Oxygen supplementation and oxygen concentration was also associated with ROP. Findings also showed no effect of gender and duration of hospital stay on ROP. **Copyright© 15 Nov, 2019.**

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Muhammad Younis Tahir	Main writer.	
2	Iftikhar Ahmad	Data collection.	
3	Soufia Farrukh	Data analysis and editing.	