



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.2526332>Available online at: <http://www.iajps.com>

Research Article

**A CROSS-SECTIONAL RESEARCH TO DETERMINE THE
OCCURRENCE OF RETINOPATHY AMONG UNDERWEIGHT
NEWBORNS WITH RESPECT TO ROP AND RELATED RISK
FACTORS**

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Abstract

Objective: To determine the frequency of retinopathy in birth weight of newborn babies.

Material and Method: Present research was cross-sectional in its design. The place of this research was Jinnah Hospital, Lahore (February to July 2017). Participant of research were sixty (N=60) newborn babies with birth weight from 800 – 2500 grams, gestational age of 28 – 40 weeks form both genders. We evaluated Retinopathy of prematurity (ROP) upon selected participants.

Result: Mean weight of participant was (1484.17 ± 532.940) grams, mean gestational age was (32.67 ± 3.767) weeks, and mean duration of hospital stay was (14.52 ± 6.606) days. There are 33% (20) patients with Retinopathy of prematurity (ROP), 55% (11) was with Grade- I ROP then 35% (7) with Grade- II ROP and then 10% (2) with Grade- III.

Conclusion: research findings indicate that many newborn babies with Retinopathy of prematurity (ROP) and the majority belong to Grade- I ROP. Retinopathy of prematurity (ROP) was developed in every newborn baby who is very premature. We concluded that a significant correlation of Retinopathy of prematurity (ROP) with the length of oxygen supplementation, weight, and gender of the baby.

Keywords: Prematurity, Retinopathy, Oxygen Supplementation and Retinopathy of Prematurity (ROP).

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Please cite this article in press Sidra Adrees et al., A Cross-Sectional Research To Determine The Occurrence Of Retinopathy Among Underweight Newborns With Respect To Rop And Related Risk Factors., Indo Am. J. P. Sci, 2018; 05(12).

INTRODUCTION:

Retinopathy of prematurity (ROP) a vasoproliferative syndrome which affects eye and pre-term babies which leads to visual impairment or blindness [1]. Survival ratio is much higher owing to fresh advancement in neo-natal protection and care [2]. In result of this occurrence of Retinopathy of prematurity (ROP) also increased [3]. It is leading reason for blindness in infants in every part of the world. Vision 2020 program also confirmed this view [4]. Different researches indicated many factors which have a causal relationship with Retinopathy of prematurity (ROP). Among these factors, three are a constant and significant correlation with it i.e., extended experience with oxygen after birth, low birth weight, and low gestational age [5]. There may be some other factors which can increase the risk like male gender, sepsis intraventricular, deprived post-natal weight increase anemia, apnea, haemorrhage, a large quantity of blood transfusions, and mechanical ventilation. It is hard to ascertain the involvement of these factors in Retinopathy of prematurity (ROP). It may possible that they just indicate the illness severity [6]. Many types of research both retrospective and perspective are present to find the frequency and precise features of Retinopathy of prematurity (ROP) on their population [7]. Pakistan is developing state in which health conditions are not satisfactory. On population ranking, it is on 6th position. Around 66 % of the people in Pakistan live in rural areas [6]. Intensive care services are not very cheap and special services are hard to find in such areas. Hence, the chance of survival is very low in these areas but Retinopathy of prematurity (ROP) is not the major cause of blindness in such areas. But in the case of urban settlements where there is the accessibility of enough facilities, we can presume that Retinopathy of prematurity (ROP) will be the main cause behind blindness in childhood. Keeping this view in mind we did this research to determine the occurrence of Retinopathy of prematurity (ROP) in premature babies and to know the risk factors related to it.

MATERIAL AND METHODS:

The present research was cross-sectional in its design. The place of this research was Jinnah Hospital, Lahore (February to July 2017). Participant of research were sixty (N=60) newborn babies with birth weight from 800 – 2500 grams, gestational age of 28 – 40 weeks form both genders. We used a digital body weighing scale to measure the weight of participants. We assessed the gestational age in accordance with mother's history, obstetric ultrasound (taken in the 1st trimester of pregnancy)

and by bodily checkup of newly born babies. The definition of Retinopathy of prematurity (ROP) performance was in harmony with International ROP classification [8]. We register the data on SPSS and analyzed on it. We calculated definite data e.g., weight in grams, length of stay at the hospital in days, gestational age, the concentration of oxygen in percentage, duration of oxygen supplementation in hours. We also calculated the frequency for gender and Retinopathy of prematurity (ROP). We dis stratification for weight, gestational age, length of stay at the hospital, the concentration of oxygen, duration of oxygen supplementation. We used the Chi-square method to observe the impact of these variables on under investigation variable (ROP). Value for p was ≤ 0.05 which significant.

RESULTS:

There are overall sixty participants of the study. Mean weight of participant was (1484.17 ± 532.940) grams, mean gestational age was (32.67 ± 3.767) weeks, and mean duration of hospital stay was (14.52 ± 6.606) days. There are 33% (20) patients with Retinopathy of prematurity (ROP), 55% (11) was with Grade – I ROP then 35% (7) with Grade – II ROP and then 10% (2) with Grade – III. We divided the research participants into four (4) categories as per their gestational age like very premature (VPT), moderate premature (MPT), late premature (LPT) and term. In very premature (VPT) group there are thirty-one participants, in moderate premature (MPT) there are nine participants, late premature (LPT) there are nine participants, and in term group, there are eleven participants. Percentages of all these groups are 51.67%, 15%, 15%, 18.33% respectively. Retinopathy of prematurity (ROP) was present in just very premature (VPT) group which is twenty patients with 64.52 %, and there is no other group in which it is observed. There is a significant correlation between ROP and gestational age ($p = 0.00$). twenty-nine (48.33%) participants were male and thirty-one (51.67%) were female. We observed Retinopathy of prematurity (ROP) in eleven male participants and in nine (29.03%) female participants. There are 2 groups of participants as per oxygen supplementation, < 10 hours and ≥ 10 hours. There were twenty-seven (45%) participants in 10 hours group and thirty-three (55%) in ≥ 10 group. There are five (18.52%) patients in < 10 hours group and fifteen (45.45%) in ≥ 10 hours group. There is a significant correlation among ROP and duration of oxygen supplementation ($p = 0.032$). There are two groups as per concentration of oxygen $\leq 60\%$ concentration group and $> 60\%$ group. Participants In $\leq 60\%$ group were nineteen (31.67%) and in $> 60\%$ group

forty-one (68.33%). We observe ROP in eight (42.11%) participants in $\leq 60\%$ group and in $> 60\%$ group it was in twelve (29.27%) participants. There is a significant correlation among ROP and concentration of oxygen ($p=0.384$). There are three groups as per weight 1500 to 2500 grams, 1000 to 1500 gram and <1000 -gram group. There are twenty-five (41.76%) participants 1500 to 2500 grams group, thirteen (21.76%) in 1000 to 1500 grams group and twenty-two (36.67%) in <1000 -gram group. We observed ROP in four (30.77%) participants in 1000 to the 1500-gram group, in <1000 -gram group it was

in sixteen (72.72%) participants. We did not observe ROP in 1500 to 2500 group. There is a significant correlation among weight and ROP ($p= 0.00$). There are forty-one (68.33%) participants in 1 to 16 days in hospital detention, and nineteen (31.67%) participants in 17 to 28 days in hospital detention. We observed ROP in twelve (29.27%) participants in 1 to 16 days in hospital detention, and eight (42.11%) participants in 17 to 28 days in hospital detention. we did not observe any correlation between ROP and hospital stay ($p=0.384$).

Table – I: ROP Grade and Frequency

ROP Grade and Frequency		Number	Percentage
ROP Frequency (60)	Yes	20	33
	No	40	67
ROP Grades (20)	Grade – I	11	55
	Grade – II	7	35
	Grade – III	2	10

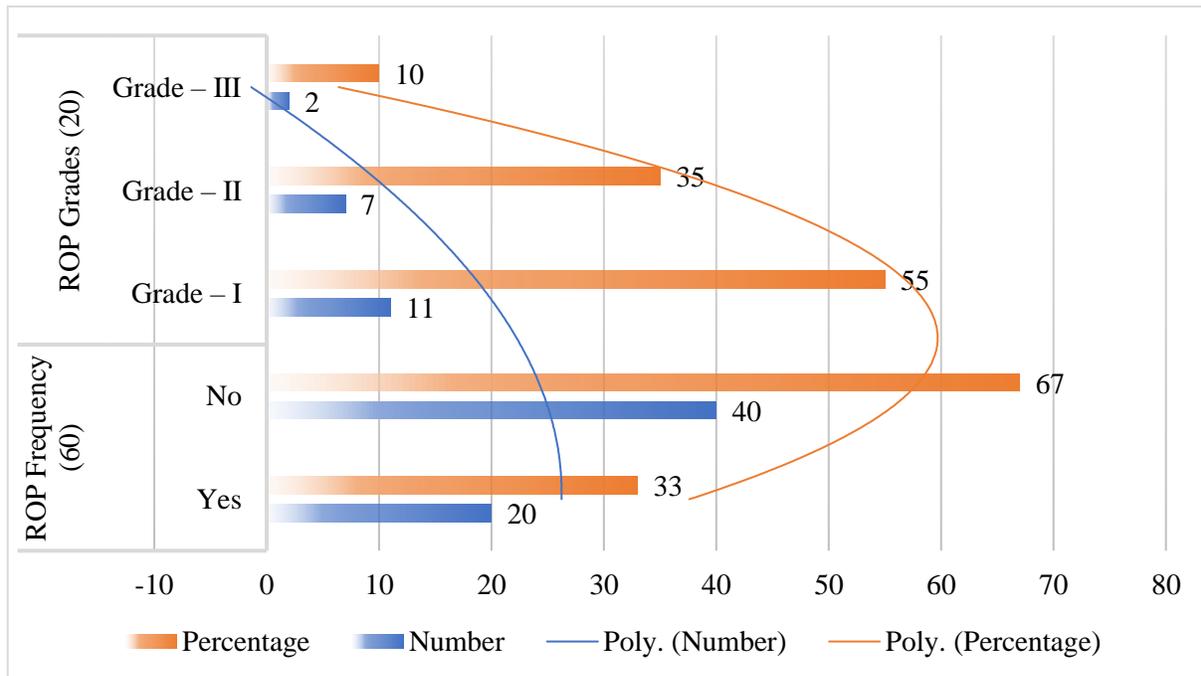
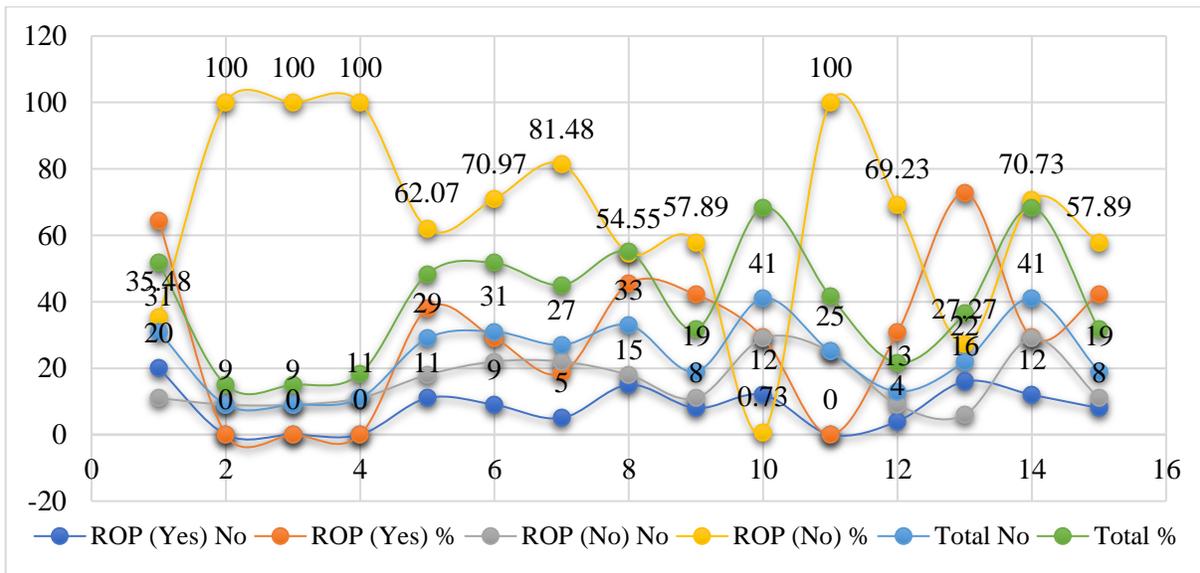


Table – II: Stratification of Associated Risk Factors

Risk Factors		ROP (Yes)		ROP (No)		Total		P-Value
		No	%	No	%	No	%	
Gestational Age (Weeks)	VPT	20	64.52	11	35.48	31	51.67	0
	MPT	0	0	9	100	9	15	
	LPT	0	0	9	100	9	15	
	Term	0	0	11	100	11	18.33	
Gender	Male	11	37.93	18	62.07	29	48.33	0.019
	Female	9	29.03	22	70.97	31	51.67	
Oxygen Supplementation Duration	< 10 Hours	5	18.52	22	81.48	27	45	0.032
	≥ 10 Hours	15	45.45	18	54.55	33	55	
Oxygen Concentration	≤ 60%	8	42.11	11	57.89	19	31.67	0.384
	> 60%	12	29.27	29	70.73	41	68.33	
Weight	1500 - 2500 Grams	0	0	25	100	25	41.67	0
	1000 - 1500 Grams	4	30.77	9	69.23	13	21.67	
	< 1000 Grams	16	72.72	6	27.27	22	36.67	
Hospitalization	1 - 16 Days	12	29.27	29	70.73	41	68.33	0.384
	17 - 28 Days	8	42.11	11	57.89	19	31.67	



DISCUSSION:

Retinopathy of prematurity (Retrolental Fibroplasia) is a problem of vasoproliferative retinopathy of premature and low birth weight of newborn babies with a degree of retinal immaturity which relies on a degree of prematurity at the time of birth [9]. Babies who are prone to risk should be treated before it gets too late where chances of reversal are diminished [10]. It is an established fact that provision of oxygen

creates the risk of Retinopathy of prematurity (ROP), but it also happens with controlled use of oxygen [11]. Respiratory Distress Syndrome (RDS) is caused by a developmental deficiency of a molecule called surfactant and this physical immaturity in lungs cause serious damage to the premature child. Children having RDS very prone to having ROP owing to oxygen for the extended time [12]. The aim of present research was to evaluate the Retinopathy in

children with low weight at the time of birth. Mean weight of participant was (1484.17 ± 532.940) grams, mean gestational age was (32.67 ± 3.767) weeks, and mean duration of hospital stay was (14.52 ± 6.606) days. There are three groups as per weight 1500 to 2500 grams, 1000 to 1500 gram and <1000-gram group. There are twenty-five (41.76%) participants 1500 to 2500 grams group, thirteen (21.76%) in 1000 to 1500 grams group and twenty-two (36.67%) in <1000-gram group. We observed ROP in four (30.77%) participants in 1000 to the 1500-gram group, in <1000-gram group it was in sixteen (72.72%) participants. We did not observe ROP in 1500 to 2500 group. There is a significant correlation among weight and ROP ($p= 0.00$). A study by Lehmann et al. said that ROP is present in premature babies around 27.2%, his results supported our results [13]. Retinopathy of prematurity (ROP) was present in fifty percent patients having weight under 1000 grams and (71.5%) newborn at a gestational age of under twenty-eight weeks. In infants ($N=1070$) Reisner et. al, observed that twenty percent pervasiveness of ROP in newborn babies having weight under 2500 grams, twenty-one percent in under 1500 grams, thirty-five in under 1259 grams, and seventy-two percent in under 1000 grams [14]. Nine percent newly born babies having the weight of under 1500 grams are on the threshold of the disease. Charles et. al., (1991) found the pervasiveness of ROP in seventy-two percent newly born babies having weight under 1200 grams and sixty-six percent in babies who born in under thirty-two weeks of gestational age [15]. In infants ($N=3025$) Purohit et. al., from different centers of USA from 1979 till 1981. He observed the pervasiveness of ROP is eleven percent in under 1750 grams and forty-three percent in weight of under 750 grams [16]. In infants ($N=950$) Hussain and his associates observed the pervasiveness of ROP 21.3% and 4.6% of level three or higher ROP [17]. Larsson and his associates observed 25.5% pervasiveness of ROP [18].

CONCLUSION:

Results of present research indicate that there is a large number of infants having ROP. Majority of such cases are in Grade - I of ROP. Retinopathy of prematurity (ROP) is found very premature babies. There is a significant correlation of Retinopathy of prematurity (ROP) with weight, the gender of the baby, and duration for oxygen supplementation is there.

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