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# Prevalence of retinopathy of prematurity at tertiary care centre in Southern Rajasthan

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## Abstract

**Introduction**: Retinopathy of prematurity (ROP) is a proliferative retinopathy and a disease of premature infants. As the awareness about the risk factors increases amongst the neonatologist and ophthalmologist, adequate screening of preterm infants is being performed at tertiary care centers which can lead to a reduction in prevalence of ROP.

**Materials and Methods:** 69 preterm infants born ≤ 34 week or birth weight ≤1700grams from January2015 to December 2016 were screened for ROP. Fundus was examined by indirect ophthalmoscopy with scleral indentation. Data was analyzed and the prevalence was calculated.

**Results:** Out of total 69 infants, males were 43 (62.31%). Mean gestational age among males and females (in weeks) was 28.66 and 29.20 respectively. Mean birth weight among males and females (in grams) was 1346.90 and 1284.40 respectively. Prevalence of ROP was 1.44%.

**Conclusion:** Prevalence of ROP is decreasing at tertiary care centers.

**Keywords:** Retinopathy of prematurity, Prevalence, Tertiary care centre, Gestational age, Birth weight.

## Introduction

Retinopathy of prematurity (ROP) is a proliferative retinopathy and a disease of premature infants .It has emerged as an important cause of preventable childhood blindness.[1,2] The prevalence of ROP varies across the globe in various countries and ranges from as low as 9% to as high as 65%.[3,8] As a result of advancements in neonatal care increasing number of preterm infants are surviving. These preterm infants are born with immature retina and takes several weeks before the retina attains maturity. It is this immature retina which is at risk of developing ROP. Moreover, several clinical trials and studies have established that development and progression of ROP can be arrested if treated early.[9-12] Hence the necessity of screening the preterm infants has arisen to detect ROP as early as possible and thereby making it possible to treat them and avoid the childhood blindness which is entirely preventable. The most important risk factors for the development of ROP are low birth weight and low gestational age.[13-15] Other risk factors for the development of ROP are oxygen concentration and duration, sepsis, respiratory distress syndrome, multiple blood transfusions, multiple births, apnoeic episodes intraventricular haemorrhage.[16] As the awareness about the risk factors increases amongst the neonatologist and ophthalmologist, adequate screening of preterm infants is being performed at tertiary care centers. Hence a reduction in prevalence of ROP is anticipated. It is to find out the changing trends in prevalence of ROP, this study has been conducted.

## Materials and Methods

A prospective study was conducted at Department of Ophthalmology, in association with Neonatal Intensive Care Unit (NICU), Geetanjali Medical College and Hospital, Udaipur from January 2015 to December 2016. The study population comprised 69 neonates. All the preterm infants admitted to the NICU during this period, with a gestational age of 34 weeks or less at birth and a birth weight of 1700 grams or less were screened for ROP and included in the study. Infants were first examined at gestational age of 31 weeks or 4 weeks after birth, whichever was later. Any history of respiratory distress, oxygen therapy and its duration, sepsis, blood transfusion, multiple pregnancy, and intraventricular hemorrhage was also noted. All the infants were dilated by the standard technique of using one drop in each eye of a combination of tropicamide 1% and phenylephrine 10% eye drop. The head was tilted to the same side immediately to wash off the extra drops to prevent systemic absorption. Pupils were checked after 20 minutes and the eye drops repeated in case of insufficient pupil dilation. Fundus examination was carried out after complete pupil dilation by the ophthalmologist experienced in ROP screening using the technique of indirect ophthalmoscopy using + 28 D lens with scleral indentation. .Pediatric eye speculum was used for eye opening and scleral indentation was done by small sized wire vectis. Tobramycin eye drops were instilled after the examination twice a day for 1 week. If no ROP was detected, follow up examinations was conducted at an interval of 2 weeks till temporal vascularisation occurred. If threshold ROP was detected, diode laser photocoagulation was done within

48 hours. All the data were entered into MS Excel and analysis was done by Statistical Package for the Social Sciences (SPSS version 18.0).

## Results

A total of 69 infants were examined of whom males and females were distributed as follows:

**Table 1: Distribution of male and female infants**

| | Number | Percentage (%) |
|---|---|---|
| **Male** | 43 | 62.31% |
| **Female** | 26 | 37.68% |
| **Total** | 69 | |

Maximum Gestational age of the infants among males and females was 32 and 31 weeks respectively while the minimum was 24 and 26 weeks respectively.

**Table 2: Distribution of gestational age of infants**

| | Mean gestational age (weeks) |
|---|---|
| **Male** | 28.66 |
| **Female** | 29.20 |

Maximum birth weight among the males and females was 1690 and 1530 grams respectively while the minimum was 990 and 1020 grams respectively.

**Table 3: Distribution of birth weight of infants**

| | Mean birth weight (grams) |
|---|---|
| **Male** | 1346.90 |
| **Female** | 1284.40 |

Out of a total of 69 infants screened for ROP, the number of infants in whom the ROP was detected was only 1.hence the prevalence of ROP was calculated as follows:

**Table 4: Prevalence of infants with ROP among infants**

| | |
|---|---|
| **Numbers of infant with ROP** | 1 |
| **Total infants examined** | 69 |
| **Prevalence of ROP (%)** | 1.44 |

## Discussion

During embryonic life, retinal vascularization begins at 16 weeks of gestation. Blood vessels grow out of the optic disc and then divide into four bundles of spindle cells which later form the four main vascular branches of the central retinal artery. Retinal vessels reach up to the nasal ora serrata by 32 weeks of gestation. Retinal vascularization till temporal ora serrata is achieved by 40 weeks of gestation. Premature delivery may disrupt this development of forming vascular arcades and an avascular peripheral zone remains after birth that may develop ischemia and proliferative retinopathy. When ROP reaches threshold stage, the peripheral avascular retina needs to be ablated. During 1980s cryotherapy was used as advocated by CRYO-ROP study.[17] But now ablation is done by diode laser photocoagulation to arrest the neovascularization and prevent the blindness.[18]

ROP is a potentially blinding disorder of preterm infants but is preventable if early screening is performed.[19]

There is a wide range of prevalence of ROP across various countries. The prevalence of ROP has been found to be 34.8% in Brunei,[20] 19.2% in Egypt,[21] 38.4% in Kuwait,[22] and up to 82% in Latin America.[23]

Low gestational age and low birth weight are considered as major risk factors. Oxygen therapy is considered to be independent risk factor in the development of ROP.[24-26] Duration of oxygen therapy for more than 7 days has also been noted as a risk factor.[27]

In addition to these, respiratory distress syndrome, patent ductus arteriosus, intraventricular hemorrhage, hypotension, and phototherapy have also been considered as risk factors.[28] Sepsis has also been considered to be a risk factor[29] but was not considered by some studies.[30-31] Due to advancements in NICU, the survival rates of preterm infants have increased. But the preterm infants have a disadvantage of getting born with immature retina which is at a risk of developing proliferative retinopathy. Earlier due to lack of awareness and treatment facilities, screening of preterm infants was not being done routinely which led to high prevalence of retinopathy and consequently blindness. Later as more and more data of prevalence of retinopathy became available along with the published benefits of treatment with cryotherapy and laser photocoagulation[32-33] which can prevent the progression of ROP, screening guidelines were put forth. As a result routine screening of pre term infants is being performed at tertiary care centers. Due to appropriate screening and coordination between neonatologist and ophthathalmogist, ROP is being diagnosed at earliest possible stage. Also with improvement in neonatal care at modern NICU monitoring of oxygen concentration and pressures, control of sepsis morbidity is minimized. This could have been a factor in reducing the prevalence of ROP at tertiary care centre.

## Conclusion

Our study proves that low gestational age and low birth weight are major risk factors in the development of ROP. Neonatologists in all the hospitals should be aware of the presence of the risk factors while monitoring preterm infants. This analysis of risk factors for development of ROP helps us to understand the disease process. Early retinal screening of preterm infants is of paramount importance in preventing the development of ROP. With modern NICU and

appropriate screening programs at tertiary care centers, the prevalence of ROP has been found to be decreasing. The prevalence of ROP in this study was found to be 1.44%. The limitation of this study is small number of subjects and short study duration. Hence a larger study of a longer duration is recommended.

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Department of neonatology, Geetanjali Medical College and Hospital, Udaipur.

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