



INCIDENCE AND SEVERITY OF RETINOPATHY OF PREMATURETY (ROP) IN THE NEONATAL INTENSIVE CARE UNIT IN SALMANIYA MEDICAL COMPLEX, BAHRAIN FROM OCTOBER 2017 TO END OF SEPTEMBER 2018

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ABSTRACT

Purpose: The purpose was to determine the incidence of retinopathy of prematurity (ROP) in Bahrain between October 2017 to September 2018.

Designs and Methods: Premature Neonates (gestational age ≤ 32 weeks, birth weight ≤ 1500 g) who were admitted to the Neonatal Intensive Care Unit at Salmaniya Medical Complex SMC were examined based on a predetermined screening protocol. The first examination was performed at 4–6 weeks of age, from October, 2017 to September 30, 2011. Data were collected on the type and incidence of each of ROP, birth weight, and age.

Results: A total of 91 premature infants comprised the study population. They were divided into 2 groups. Group I (<1000 g), and Group II (1000–1500 g), included 40 (44%) and 51 (56%) neonates. ROP was detected in 23 (25.3%) infants. There were 40 (44%) infants with a birth weight <1000 g, of which 13 (32.5%), Birth weight of <1000 g was significantly associated to ROP.

Conclusion: One-fourth of premature neonates had ROP in Bahrain. Birth weight <1000 g was a risk factor for ROP.

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INTRODUCTION

Retinopathy of prematurity (ROP) is a developmental disorder of the retinal vasculature that occurs in infants born prematurely, prior to full vascular development of the retina. (1) The incidence of retinopathy of prematurity was noted to increase due to the continuous improvement of neonatal intensive care and the improvement of the survival rates of preterm children.

Retinopathy of prematurity is one of the leading causes of lifelong visual impairment among children in developed countries. In United states, about 1100-1500 infants require treatment for Retinopathy of prematurity each year and of them 400–600 infants become legally blind from ROP. (4) Therefore, it is of high importance to study ROP to prevent the lifelong consequences.

In a study done between the 2002–2011 in the Kingdom of Bahrain, One-fifth of premature infants had retinopathy of prematurity (3).

Screening premature infants for ROP in Bahrain has started at Salmaniya Medical Complex (SMC) in 1996. (3) Neonates with gestational age of ≤ 32 weeks, a birth weight ≤ 1500 gm Those had received supplementary oxygen treatment are at specific risk of developing retinopathy of prematurity (2) and were all included in the screening program.

The aim of this study is to reassess the applicability of the current ROP screening criteria and to compare our data with previous years data and with international rates.

DESIGNS AND METHODS

This is a retrospective study, including all infants with a birth weight ≤ 1500 and a gestational age ≤ 32 weeks who were admitted to the Neonatal Intensive Care Unit (NICU) at Salmaniya medical complex SMC and were examined 4–6 weeks after birth from October 2017 to end of September 2018 using (Guideline for the Screening and Treatment of Retinopathy of Prematurity of the Royal College of Pediatrics and Child Health, Royal College of Ophthalmologists, British Association of Perinatal Medicine & BLISS 2008).(5) This was performed by reviewing the screening forms attached to the medical record [Figure 1].(3) Data were collected via chart review on gestational age, birth weight, clinical information, and the presence of other disease. Newborns who died before 6 weeks of age were excluded.

Data were collected by searching the neonatal intensive care unit NICU database and National Health Information System (I-SEHA), which included clinical information about neonates and ROP. Ethics approval for this study was obtained from the secondary care research committee. Infants were included in this study if they were born at SMC or any of the Ministry of Health maternity hospitals, transferred and admitted to the

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NICU at SMC, and were examined and monitored by an Ophthalmologist.

The International classification of ROP and American Academy of Pediatrics recommendations were used for classification of the findings.⁶The findings were classified according to the maximum stage of ROP in either eye.

Examinations were performed at the main neonatology unit in Bahrain, which has four consultant neonatologists, a capacity of 50 neonates. If ROP was not noted, eye examinations were performed until full vascularization reached zone 3 of the retina.

It was the responsibility of the medical and nursing staff to ensure that the examinations were scheduled at the appropriate ages based on the guidelines. To examine the peripheral retina, tetracaine 1%, tropicamide 1% was instilled with phenylephrine 2.5%, and a sterile eyelid specula and scleral depressor were used as necessary. A binocular indirect ophthalmoscope was used with a handheld lens (28D or 30D). Ophthalmologists also followed any other local criteria for maintaining sterility.

The Ophthalmologist documents the vascularity of the retina and the stage of ROP on the ROP screening form, and Indicates the timing of the follow-up.

For analysis, follow-up examinations for those with ROP were screened at intervals indicated by the severity of the disease. Infants were monitored until a diagnosis of ROP was established as ROP or another disease. More frequent examinations to monitor the course of ROP were performed. The ET-ROP trial presented a “type1” of treatment for ROP which was defined as any ROP stage in zone I when accompanied by plus disease, Stage 3 to any extent within zone I or Stage 2 or 3 in zone II, together with plus disease. “type2” Defined as zone 1 stage 1 or 2 without plus disease and zone 2 stage 3 without plus disease. Infants were classified according to the birth weight into Group 1 who were <1000 g, and Group II, who were between 1000 and 1500 g. (12)

The data were collected and analyzed using Microsoft Excel[®] software. Univariate analysis was performed using a parametric method for calculating frequencies and percentage proportions of qualitative variables.

RESULTS

The study population included 91 premature infants. There were 40 [44%] infants in Group 1 <1000 g and 51 [56%] infants in Group II >1000g.

ROP at any stage was detected in 23 of 91 infants. This leads to an incidence of 25.3%. Type 1 disease was detected in 7 infants (7.7%) infants, which required mainly anti-VEGF injections with one child needing laser treatment. No infants needed surgery or documented to have stage 4 nor stage 5 ROP. 66.7% (6/7) of the ROP cases occurred in neonates with BW <1000 g. (Table 1)

Table 1

Birth Weight	Total	Non ROP	ROP	Type 1 ROP	Type 2 ROP
< 1000 g	40(44%)	24(36.9%)	13(56.5%)	6(66.7%)	34(40.5%)
1000g and above	51(56%)	41(63.1%)	10(43.5%)	1(14.3%)	50(59.5%)
Total Cases	91	65	23	7	84

The average estimated gestational age (EGA) at birth was 28.2 weeks. The mean birth weight was 1132g. The mortality is 3.3% (Table 2) could be due to extreme prematurity.

Table 2

	N (%)
Nationality	
Bahraini	69 (74.2)
Non Bahraini	24 (25.8)
Gender	
Male	44 (47.3)
Female	49 (52.7)
Delivery	
N	40 (43.5)
C	52 (56.5)
Weight	
< 1000 g	40 (44)
1000g and more	51 (56)
Twin	
Normal	61 (67.0)
Yes	30 (33.0)
ROP	
No	65 (73.9)
Yes	23 (26.1)
Mort.	
No	88 (96.7)
Yes	3 (3.3)

Figure 1

DISCUSSION

Our study represents the incidence of ROP in a year. It is the second study to reflect the population of Bahrain.

Salmaniya medical complex where the study was conducted comprises majority of the deliveries in Bahrain. The incidence of ROP in previous studies varies by region from 0.7% to 56% (7)(8)(9)(10)(11).The incidence of ROP in the current study falls in the international range. However, it shows an increase from the study conducted in between 2002-2011. (3) which could be attributed to improvement to survival rates of neonates in the NICU.

It was noted that different screening protocols were used some even included children more than 1500 g and older than 32 weeks (11).

Mean gestational age and birth weight of infants with severe ROP in the present study were 28 weeks and 1132 g, respectively. Gestational age and birth weight were significantly correlated with ROP in the present study. Birth weight and gestational age in the ROP group were significantly lower than in the non-ROP group.

These findings are consistent with other studies that birth weight and gestational age are important factors associated with ROP. In some recent studies, extremely premature infants with lower gestational age had a higher incidence of type 1 ROP. Only one infant with a gestational age >26 weeks at birth or birth weight >1000 g had type 1 ROP. Birth weight may not influence the incidence of type 1 ROP in extremely premature infants. Şahin et al. was found no association between type 1 ROP and BW in extremely preterm infants with a GA of <28 weeks.

ROP is a potentially avoidable cause of blindness in children. The proportion of blindness resulting from ROP varies greatly among countries and is influenced both by levels of neonatal care (in terms of availability, access, and neonatal outcomes) and the availability of effective screening. There are some limitations to this study. First, the study was conducted among Inpatients in the NICU and thus could misrepresent the general incidence of ROP. Second, premature infants were referred to neonatal units at other Ministry of Health hospitals once they were stabilized systemically, and although most of the infants returned to our hospital for follow-up, we were unable to access complete documentation. Third, many factors are involved in the development and progression of ROP. We have not study risk factors related to presence or absence of ROP.

Last the sample size and the duration of the study were very limited.

Introducing a pentacam to the screening program may help better documentation of the disease stages and grades and remove inspector error.

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CONCLUSION

The incidence of ROP was 25.3%. ROP cases were associated with birth weight <1000 g. 85.7 % of all patient's that required intervention had a birth weight less than 1000g. The incidence of ROP in Bahrain is within international range. No significant visual disability was noted in the studied sample as majority didn't need any intervention, and the ones who needed intervention didn't need a surgical intervention.

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