Incidence and Risk Factors for Retinopathy of Prematurity in Premature Born Children in Tabuk City

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ABSTRACT
Introduction: Retinopathy of prematurity (ROP) is a disease of the eye that considers as one of a complication of preterm birth which characterized by abnormal growth of retina blood vessels at a junction of the vascularized retina and avascular peripheral retina, and it is one of the causes of blindness that can be prevented by early screening and intervention. The major risk factors for development ROP which investigated in many studies include low gestational age at birth, low body weight, duration of oxygen administration, NICU admission and number of days stay in the hospital.

Methods: A retrospective study conducted at King Khaled hospital in Tabuk city to evaluations all preterm infants for development ROP. We observe all premature infants who admitted to NICU in the period from January 2016 to April 2018.

Results: 108 files were included in our study. Out of 108 files, 61, 47 files are belongs to male and female respectively, majority (91.6 %) were ≤ 32 weeks gestational age, 72.2% weight between 1000-1500g at birth, one third (33.3%) diagnosed with retinopathy of prematurity (ROP). Out of 36 (33.3%) who was diagnosed with retinopathy of prematurity (ROP), 50% were male and 50% were female, 94.4% were aged ≤ 32 weeks, 91.6% receive oxygen therapy for more than one week, 66.7% weight between 1000-1500g at birth and 52.8% receive blood transfusion.

Conclusion: The prevalence of ROP in our study was 33.3%; the risk factors for ROP include but not limited to aged ≤ 32 weeks, receive oxygen therapy for more than one week, weight between 1000-1500g at birth and receiving blood transfusion. Both eye were affected, ROP stage 1, ROP zone3 in majority of the cases.

Keywords: Retinopathy of Prematurity; Tabuk; Saudi Arabia.

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INTRODUCTION
Retinopathy of prematurity (ROP) is a disease of the eye that considers as one of a complication of preterm birth which characterized by abnormal growth of retina blood vessels at a junction of the vascularized retina and avascular peripheral retina, and it is one of the causes of blindness that can be prevented by early screening and intervention.1,2

The main cause of visual impairment and blindness in ROP is retinal detachment secondary to scarring of abnormal retina blood vessels.2 Worldwide in 2010 the ROP developed in about 184,700 (uncertainty range (169,600–214,500 ) preterm infants, about 20,000 (15,500–27,200) of them become blindness or severe visual impairment secondary to ROP and 12,300 developed mild to moderate visual impairment and in the United State, the incidence decreased from 14.70% to 10.88% between 2000 to 2010.3,4 One of the studies that conducted in Saudi Arabia in Riyadh reported the incidence of ROP is 56% in 2008 and other study conducted in Jeddah in 2016 reported the incidence of ROP was 33.7%.5 The ROP classified into 5 stages, stage 1 is a demarcation line, stage 2 is a ridge with height and width, stage 3 is a proliferation of fibrovascular in extra retinal, stage 4 is partial retinal detachment and stage 5 is total RD.6

The major risk factors for development ROP which investigated in many studies include low gestational age at birth, low body weight, duration of oxygen administration, NICU admission and number of days stay in the hospital.1,2,6-8

The other risk factors for ROP which include surfactant therapy, sepsis, Intrauterine Growth Restriction (IUGR), intraventricular hemorrhage and patent ductus arteriosus (PDA), blood transfusion1,2,7,8

However, there are no studies conducted in Tabuk city about the incidence of retinopathy of prematurity and its risk factors.
So our aim to report the incidence and risk factors of retinopathy of prematurity in premature born children and investigate the common risk factors for ROP to aware the pediatricians and ophthalmologist about the important screening of all premature born infant <34 weeks and or low birth weight < 1500 g.

**METHODOLOGY**

A retrospective study conducted at King Khaled hospital in Tabuk city to evaluations all preterm infants for development ROP. We observe all premature infants who admitted to NICU in the period from January 2016 to 2018.

**Inclusion Criteria**

All premature infants who born less than 34 weeks gestational age and or weight at birth less than 1500g.

**Table 1: General characteristic of study sample**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Total :108</th>
<th>body weight at birth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>61</td>
<td>56.4%</td>
</tr>
<tr>
<td>Female</td>
<td>47</td>
<td>43.5%</td>
</tr>
<tr>
<td>Gestational age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 32 weeks</td>
<td>99</td>
<td>91.6%</td>
</tr>
<tr>
<td>33 – 34 weeks</td>
<td>9</td>
<td>8.3%</td>
</tr>
<tr>
<td>Developed ROP</td>
<td>36</td>
<td>33.3%</td>
</tr>
</tbody>
</table>

**Table 2: Risk factors for retinopathy of prematurity**

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Developed ROP (N= 36)</th>
<th>No ROP (N=72)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepsis</td>
<td>16 44.4%</td>
<td>31 43%</td>
</tr>
<tr>
<td>IUGR</td>
<td>9 25%</td>
<td>11 15.3%</td>
</tr>
<tr>
<td>Blood Transfusion</td>
<td>19 52.8%</td>
<td>25 34.7%</td>
</tr>
<tr>
<td>Gestational Age ≤ 32 Weeks</td>
<td>34 94.4%</td>
<td>65 90.2%</td>
</tr>
<tr>
<td>Gestational Age Between 33 – 34 Weeks</td>
<td>2 5.5%</td>
<td>7 9.7%</td>
</tr>
<tr>
<td>Body Weight &lt; 1000g</td>
<td>10 27.8%</td>
<td>4 5.6%</td>
</tr>
<tr>
<td>Body Weight 1000-1500g</td>
<td>24 66.7%</td>
<td>54 75%</td>
</tr>
<tr>
<td>Body Weight 1500g&gt;</td>
<td>2 5.6%</td>
<td>14 19.4%</td>
</tr>
<tr>
<td>Oxygen Therapy For 7 Days</td>
<td>3 8.3%</td>
<td>23 32.9%</td>
</tr>
<tr>
<td>Oxygen Therapy For More Than 7 Days</td>
<td>33 91.6%</td>
<td>47 67.1%</td>
</tr>
<tr>
<td>Intraventricular Hemorrhage</td>
<td>7 19.4%</td>
<td>7 9.7%</td>
</tr>
<tr>
<td>Patent Ductus Arteriosus (PDA)</td>
<td>6 16.7%</td>
<td>5 6.9%</td>
</tr>
</tbody>
</table>

**RESULTS**

A total of 114 files was reviewed, 3 incomplete files and 3 files were belongs to deed infants were excluded, 108 files were included in our study. Out of 108 files, 61, 47 files are belongs to male and female respectively. Majority (91.6 %) were ≤ 32 weeks gestational age, 72.2% weight between 1000-1500g at birth, one third (33.3%) diagnosed with retinopathy of prematurity (ROP). (Table 1)

Out of 36 (33.3%) who was diagnosed with retinopathy of prematurity (ROP), 50% were male and 50% were female, 94.4% were aged ≤ 32 weeks, 91.6% receive oxygen therapy for more than one week, 66.7% weight between 1000-1500g at birth and 52.8% receive blood transfusion. (Table 2, Figure 1)

According to zone of retinopathy of prematurity (ROP) zone 1, 2 and 3 presented in 2.7%, 29.7% and 67.6% respectively. Both eyes were affected in 77.7% of the cases. 67.5% had stage 1 of retinopathy of prematurity (ROP). Plus disease account 6.3%. Three cases were in need for intervention, two of them had ROP laser and one case had ROP surgery. (Figure 2, Figure 3)
Figure 1. Risk factors for retinopathy of prematurity.

- Gestational age ≤ 32 weeks: 94.4%
- Oxygen therapy for more than 7 days: 91.6%
- Body weight 1000-1500g: 66.7%
- Blood transfusion: 52.8%

Figure 2. Stages of the retinopathy of prematurity among premature infants.

- Stage 1: 67.6%
- Stage 2: 27%
- Stage 3: 5.4%

Figure 3. Assessment of ROP location.

- Right eye: 77.7%
- Left eye: 16.6%
- Both eyes: 5.5%
DISCUSSION

The incidence of ROP in our study is 33.3%; which is less than 41% as reported in Al-Amro et al study which conducted in 2003 at King Khalid University Hospital in Riyadh, Saudi Arabia.10 On the other hand our incidence in relatively equal to Waheeb S et al who conduct a study about Incidence of retinopathy of prematurity at two tertiary centers in Jeddah, Saudi Arabia and report an incidence of 33.7%.11 A lot of risk factors are linked to development of ROP such as low gestational age, low birth weight, sepsis, oxygen therapy and blood transfusion. 11 In our study, aged ≤ 32 weeks, receive oxygen therapy for more than one week, weight between 1000-1500g at birth and receiving blood transfusion were found to be risk factors for development of ROP.

CONCLUSION

The prevalence of ROP in our study was 33.3%; the risk factors for ROP include but not limited to aged ≤ 32 weeks, receive oxygen therapy for more than one week, weight between 1000-1500g at birth and receiving blood transfusion. Both eye were affected, ROP stage 1, ROP zone 3 in majority of the cases.

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REFERENCES


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