Knowledge Attitude Practice Study of Retinopathy of Prematurity amongst Pediatricians attending a Neonatal Ventilation Workshop in South India

1Padmaja Kumari Rani, 2Subhadra Jalali
1Consultant, Retina Services, Smt Kanuri Santhamma Center for Vitreoretinal Diseases, Kallam Anji Reddy Campus
LV Prasad Eye Institute, Hyderabad, Andhra Pradesh, India
2Head, Retina Services, Smt Kanuri Santhamma Center for Vitreoretinal Diseases, Kallam Anji Reddy Campus
LV Prasad Eye Institute, Hyderabad, Andhra Pradesh, India

Correspondence: Padmaja Kumari Rani, Consultant, Retina Services, Smt Kanuri Santhamma Center for Vitreoretinal Diseases, Kallam Anji Reddy Campus, LV Prasad Eye Institute, Banjara Hills, Hyderabad-500034, Andhra Pradesh, India
Phone: +91-40-30612607, Fax: +91-40-23548271, e-mail: rpk@lvpei.org

ABSTRACT

Objectives: To assess the knowledge, attitude and practice patterns (KAP) of pediatricians about retinopathy of prematurity (ROP).

Methods: We administered a questionnaire to pediatricians, prior to a talk on ROP, in a neonatology ventilation workshop. Questions included finding information about their educational and practicing profile, knowledge of screening guidelines, risk factors for ROP, referral facilities and barriers for referral.

Results: A total of 38 pediatricians participated in the study. The mean age of the participants was 35.83 ± 7.2 years, 86.8% of them were men. All participants (100%) knew about the risk factors for ROP. 97.4% (37/38) of the participants knew about the ROP screening guidelines and 68% (26/38) knew about the laser treatment for ROP. Only 29% (11/38) knew the composition of dilating drops to be used for preterm babies and 53% (20/38) had an established referral program for ROP. The barriers for ROP screening expressed by pediatricians, included ‘parents not willing’, by 7/38 of the participants (18.4%); ‘unaware of referral facilities’ by 6/38 of the participants (15.8%) and ‘too expensive’ by 5/38 of the participants (13.1%). Regarding barriers for ROP screening, ‘parents not willing’ reason was expressed by 18.4% (7/38), ‘unaware of referral facilities’ by 15.8% (6/38) and ‘too expensive’ by 13.1% (5/38) of the participants.

Conclusions: The study findings suggest that a large majority of pediatricians at a neonatology ventilation workshop were aware of the science of ROP but had less information of ROP service delivery and treatment modalities. The study suggests the need for creating awareness and close coordination between pediatricians and ophthalmologists to address the barriers for screening and service delivery for ROP. This will facilitate taking the science from books and journals to the bedside of the premature neonates and help in reducing needless blindness due to untreated ROP.

Keywords: Knowledge, Attitude, Practice, Pediatricians, Retinopathy of prematurity.

INTRODUCTION

Retinopathy of prematurity (ROP) is emerging as an important cause of preventable blindness in both developed and developing countries. In middle-income countries, ROP screening is recommended in all infants with risk factors, such as low birth weight < 2000 gm, gestational age < 35 weeks, multiple births, eventful postnatal period like oxygenation, sepsis, respiratory distress syndrome and blood transfusions.1

Advancements in neonatal care, in recent years, has led to an increase in the survival rate of low-birth infants. This, in turn, has led to a rise in the incidence of ROP. Recent estimates suggest that globally more than 50,000 children are affected with ROP. In India alone, 500 children are estimated to become blind due to ROP every year.2 In an assessment of ROP prevalence, based on infant mortality rate per year (9-60/1000 live births), India and China are at high-risk and it is in these countries that ROP is emerging as an important cause of blindness. This has been referred to as the “third epidemic” of ROP.2 To combat this third epidemic of ROP, comprehensive screening programs are the need of hour.3

Neonatologists/pediatricians are vital team members in any screening program. They are instrumental in identifying and referring babies at risk of developing ROP to the ophthalmologists. Thus, awareness of ROP screening guidelines, risk factors, referral indications and resource availability among pediatricians is of paramount importance. The present study is conducted to assess the knowledge, attitude and practice patterns (KAP) of pediatricians about ROP. To the best of our knowledge, this information has not been reported from India.

MATERIALS AND METHODS

We conducted a questionnaire-based assessment of knowledge, attitude and practice patterns about ROP among pediatricians...
Appendix (1): ROP-KAP questionnaire
Knowledge, Attitude and Practice Proforma

1. Name _______________________________________________  2. Age _______________________________________________
3. Gender. 1. Male  2. Female
4. Educational qualification ____________________________________________________________
5. E-mail ID ____________________________________________________________
6. Contact number ____________________________________________________________
7. How many years have you been in practice? ____________________________________________
8. Name of place of practice (can name multiple) __________________________________________
9. Type of practice: Solo private/ group practice/institutional-teaching private/institutional teaching govt/nonteaching govt/any other specify __________________________________________
10. How many preterm babies you see in a month? _________________________________________
11. At what age do you think the preterm babies should be screened for ROP?  1 month ______ 1.5 months ______ 2 months ______ 3 months ______ 6 months ______
12. Which birth weight and gestational age do you think should be screening criteria for ROP screening indication in preterm babies?  
   Birth weight ____________________________________________________________  
   Gestational age at birth __________________________________________
13. Do you refer your babies to an ophthalmologist—Yes/ no __________________________________
14. At what age do you refer your babies to an ophthalmologist? __________________________________________
15. How do you refer?  
   1. Write in discharge slip  
   2. Inform parents verbally  
   3. Nurse/ assistant informs verbally  
   4. Leave it to parents to decide  
   5. Provide information on hospital wall  
   6. Provide any written brochure  
   7. Phone and inform parents (more than one can be ticked) __________________________________________
16. Name some risk factors for ROP (can name multiple) ______________________________________
17. Name the SAFE dilatation drops used for preterm babies ______________________________________
   and the unsafe dilating drops __________________________________________
18. Mention the composition of the dilatation drops for preterm babies __________________________________________
19. Barriers for referring the babies for ROP screening:  
   1. Parents not agreeing  
   2. Discharge person not writing  
   3. Ophthalmologist not available  
   4. Not knowing where to refer  
   5. Too expensive  
   6. Not necessary as my babies do not get retinopathy of prematurity  
   7. Others (specify) __________________________________________
20. What are the important treatment modalities available for ROP? __________________________________________
21. When should one initiate treatment after diagnosis of sight threatening ROP? __________________________________________
22. Are there any risks of screening? __________________________________________
23. Are there any risks of treatment? __________________________________________
24. In your opinion how successful is ROP treatment in preventing blindness:  
25. How many babies did you see blind or affected due to ROP approximately?  
   1. Blind due to ROP __________________________________________  
   2. ROP affected but not blind __________________________________________
26. Do you have referral facility to an ophthalmologist trained in ROP management—Yes/ no __________________________________________
27. Name facilities for ROP screening in your city/town (more than one can be named) __________________________________________
attending a ventilation workshop (Appendix 1). The questionnaire was administered and the response sheets were collected prior to a talk on ROP.

The ROP related questionnaire contained questions for collecting information about their educational and practice profile, knowledge regarding screening guidelines, risk factors, dilatation drops, treatment modalities and risks of both screening as well as treating preterm babies afflicted with ROP. Attitude assessment questions included knowing the method of referral to ophthalmologists and barriers for referring babies for ROP screening. Practice-based questions included finding the mode of referral and the time of referral to ophthalmologists.

RESULTS
A total of 38 pediatricians participated in the study. The mean age of the participants was 35.83 ± 7.2 years (range 26-50 years). 86.8% (33 out of 38) of them were men. Majority of them (78.9%) were postgraduates and 21.1% had diploma qualification in pediatrics. Out of the 38 pediatricians, nine were practicing for more than 10 years, seven were having about 5 to 10 years of practice experience and 22 were having less than 5 years practice experience. One participant sees more than 50 preterm babies per month; four participants see between 30 and 40 preterm babies per month; nine participants see between 10 and 30 preterm babies per month and the rest (24) see less than 10 preterm babies per month.

Table 1 summarizes the results of knowledge, attitude and practice patterns of ROP among the pediatricians in the study.

DISCUSSION
It is heartening to note that a majority of the pediatricians (97.4%) attending the ventilation workshop were aware of the screening guidelines for ROP in preterm infants. According to them, 4 to 6 weeks of life was the ideal time for screening for these babies. Similarly, low birth weight (below 2000 gm) was considered for referral of babies by all participants, except one. Similar to our study, Kemper et al found that many neonatologists used a more inclusive gestational age criterion for identifying children for ROP screening than is currently recommended. As time is a crucial parameter in ROP screening we would like to create awareness among the pediatricians following a uniform screening protocol with the concept of “20th day screening strategy” for babies born at less than 30 weeks gestational age to detect acute posterior ROP at the earliest and “30th day screening strategy” for babies born between 30 and 35 weeks.

Participants were also aware of the important risk factors for ROP, such as low birth weight, prematurity and oxygen therapy. Few participants (4/38) mentioned additional risk factors, such as anemia, blood transfusions and sepsis. This awareness level about the risk factors among pediatricians is

<table>
<thead>
<tr>
<th>Questions</th>
<th>Majority response (%)</th>
<th>Minority response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Time of screening</td>
<td>One month of age (71.1)</td>
<td>1.5-2 months (26.3)</td>
</tr>
<tr>
<td>2. Gestational age</td>
<td>30-35 weeks of GA (63.2)</td>
<td>&lt; 30 weeks also (21.1)</td>
</tr>
<tr>
<td>3. Birth weight criteria</td>
<td>1000-1500 gm (47.4)</td>
<td>1000-2000 (28.8) and 1 participant (GA &gt; 35 weeks and BW &gt; 2000 gm)</td>
</tr>
<tr>
<td>4. Risk factors for ROP</td>
<td>Prematurity, low birth weight, oxygen therapy (100)</td>
<td>Anemia, blood transfusions and sepsis (1)</td>
</tr>
<tr>
<td>5. Knowledge of dilatation drops</td>
<td>Did not know the names (50)</td>
<td>Not familiar with composition of drops (71)</td>
</tr>
<tr>
<td>6. Knowledge of treatment modalities for ROP</td>
<td>Laser photocoagulation as Rx (68)</td>
<td>Does not know (33)</td>
</tr>
<tr>
<td>7. When should the Rx for ROP start</td>
<td>Did not respond (50)</td>
<td>Start immediately (34)</td>
</tr>
<tr>
<td>8. Risks of treatment</td>
<td>No risk (65)</td>
<td>Based on severity of ROP (16)</td>
</tr>
<tr>
<td>9. How successful is ROP Rx in prevention of blindness</td>
<td>Good (57.9)</td>
<td>Apnea as a risk factor (5)</td>
</tr>
<tr>
<td>10. How many babies they have seen of ROP with blindness</td>
<td>Did not see any (81)</td>
<td>Less than four babies (15)</td>
</tr>
<tr>
<td>11. How many babies they have seen of ROP but without blindness</td>
<td>Between 1-50 babies (63.2)</td>
<td>Not seen (36)</td>
</tr>
<tr>
<td>12. Availability of referral services for ROP</td>
<td>Has referral facilities(53)</td>
<td>Do not have a referral facility (47)</td>
</tr>
<tr>
<td>13. Mode of referral to ophthalmologist</td>
<td>LVPEI as referral facility (50)</td>
<td>Nurse informs (0.3)</td>
</tr>
<tr>
<td>14. Barriers for ROP screening</td>
<td>Write in discharge slip (86.4)</td>
<td>Regular ROP screening tie-up (50), leave it to parents (1.5) and information on hospital wall (1.9)</td>
</tr>
<tr>
<td>15. Unaware of referral facilities (15.8)</td>
<td>Too expensive (13.1)</td>
<td></td>
</tr>
</tbody>
</table>
Indeed a welcome sign in the fight against ROP blindness. We can further enhance these awareness levels by disseminating information about oxygen therapy modulation (individual monitoring and keeping oxygen saturation between 88 and 94% with minimal fluctuation) during NICU care of preterm babies and control the anemia while following up or treating ROP babies with laser photocoagulation.

Majority of the participants (71%) did not know the composition of dilating drops. This is critical because some dilating drops like atropine and 10% phenylephrine can cause life-threatening complications and are contraindicated in these babies. Though it is the responsibility of the ophthalmologist to use the correct dilating drops, it is also important for the pediatrician to be aware as to which drops are allowed into the NICU environment and which are not.

Only 68% were aware of laser photocoagulation as a treatment modality and only about 50% were aware of the need to do laser treatment immediately after detection of sight-threatening ROP. These results indicate the need to share with pediatricians, knowledge about ROP and the various treatment guidelines. Even decades after randomized clinical trials for ROP have been published and discussed in ophthalmic literature, the information has not translated into information in books, journals and training programs of pediatricians. Partnership group, such as NO-ROP group\(^5\) where neonatologist and ophthalmologist share knowledge and work together, is possibly one way to handle this problem. Another important step in the Indian context is to have consensus and uniform published screening guidelines for ROP by ophthalmic, pediatric and neonatal societies. Attempts are underway regarding the same.\(^5\)

Finding barriers is vital for formulating any successful screening models. In this study, 18.4% of the pediatricians identified ‘parents not willing’ as a barrier for ROP screening while ‘unaware of referral facilities’ was cited by 15.8% and ‘too expensive’ was cited by another 13.1%. There is paucity of literature regarding this subject. In a study done by Mohammad et al from the United States\(^6\) about barriers for ROP screening or follow-up eye care after discharge from the NICU, it was found that infants who were not screened for ROP in the NICU had a greater risk for missing follow-up eye care compared to the infants who had their first retinal examination in the NICU [relative risk 4.25, 95% CI (1.42 -12.73)].

A key element for a successful screening model for ROP will be the availability of referral services. In our study, about 50% of participants were not aware of the availability of referral services for ROP. This issue points to the need for establishing more referral facilities and disseminating information about ROP. In the study done by Kemper et al, in a questionnaire survey of neonatologists regarding the barriers for ROP screening, the most commonly reported major barrier was the lack of available eye care specialists.\(^7\) This indicates the need for postgraduate, undergraduate and in-service training programs for ROP in developing eye care work force who can effectively screen and manage ROP.

At present, there are very few dedicated hands-on fellowship training programs in ROP. We have been running a one-month hands-on course in this area since 2000. More such programs are needed across the globe, till the topic gets incorporated into regular undergraduate, postgraduate and fellowship teaching programs. At the undergraduate level, all students should be aware of ROP, screening guidelines and risk factors. At the postgraduate level, the students should be familiar about screening for ROP and appropriate referral guidelines for laser treatment for ROP. Fellowship programs in retina as well as pediatric ophthalmology must focus on providing adequate hands-on expertise in both screening and treatment of ROP.

The questionnaire assessment, in the present study, was given to a small group of neonatologists attending a meeting and, hence, the results of the study cannot be extrapolated to the entire population of pediatricians.

Overall, the ROP screening program needs to be based on a multipronged approach.\(^3\)

There is an urgent need for creating awareness among pediatricians by dissemination of information about ROP through seminars and literature. ROP is an important cause of avoidable blindness.\(^2\) It satisfies the WHO cardinal principals of screening for a disease with defined natural history and progression of disease, and with gold standard modalities of diagnosis, such as indirect ophthalmoscopy and wide field retinal photography.\(^1\)\(^,\)\(^8\) It is a potentially treatable condition with excellent treatment outcomes with timely laser photocoagulation.\(^1\)

Creating awareness among key members involved in preterm baby care will create a great impact and aid in reducing the burden of avoidable blindness due to ROP.

The advent of teleophthalmology holds great promise for the future of ROP screening; appropriate coordination between neonatologists and ophthalmologists can help develop a cost effective and comprehensive screening model for ROP which can be suitable for both developed as well as developing countries.

ACKNOWLEDGMENT

The study is supported by Hyderabad Eye Research Foundation.

REFERENCES