Section: Ophthalmology

Original Research Article

TO STUDY THE PROFILE OF RETINOPATHY OF PREMATURITY IN TWIN BABIES AT TERITIARY CARE CENTER

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ABSTRACT

Background: Twin babies provide a good study model since they have the same GA and are exposed to the same prenatal risk factors. Thus, it helps us to analyze the role of systemic complications in development and progression of ROP in two premature babies exposed to same risk factors. hence, the study was undertaken. The objectives of the study were to determine, profile of ROP in twin babies.

Materials and Methods: A prospective interventional clinical study was done from, November 2016 to May 2018 in 100 preterm babies, less than or equal to 32 weeks of gestational age (GA) & less than or equal to 1500 gram of birth weight (BW) at Vani Vilas Hospital attached to Bangalore Medical College and Research Institute, Bangalore. ROP screening was performed by dilated fundoscopy using indirect ophthalmoscope with 20D lens and all babies were followed up till complete vascularisation of the retina. The babies who developed any stage of ROP were taken as cases and the babies who did not have ROP were taken as controls.

Results: 100babies/50 pairs (76.92%) satisfied the inclusion criteria and were enrolled in the study. Out of 50 pairs of twins, 10 pairs developed ROP. In our study we found that most commonly identical twins (p 0.001, significant) affected than non-identical twins, smaller baby affected more than larger baby (p 0.007, significant), Male babies affected more than female babies (p 0.07), ROP development between 2nd born and born is 6:4(p 0.37). With regarding to laterality both eyes affected in all 10 babies and stage and zone of affection remains same in both the eyes. In our study, 6 babies (60%) developed zone-2 stage-1 ROP, 3 babies (30%) developed Zone-2 Stage-2 ROP with plus disease & one baby (10%) developed Zone-2 APROP with plus disease.

Conclusion: Thorough fundus examination with indirect ophthalmoscopy should be done in all preterm babies as per the guidelines and screening should be intensified in the presence of factors like RDS, oxygen administration.

Keywords: Retinopathy of Prematurity; ROP screening; Gestational Age; Birth Weight; Risk Factors of ROP.

INTRODUCTION

Retinopathy of Prematurity (ROP), previously called as Retrolental Fibroplasia is a potentially blinding Vasoproliferative disease in premature babies.[1] Preterm infants are more prone for this disease especially low birth weight (LBW) neonates who are exposed to large amount of oxygen (O2). It is the major cause of preventable blindness in infants.[2] Presentation and course of ROP is determined by complex interaction of several risk factors like gestational age (GA), birth weight (BW) and many systemic risk factors like anemia, sepsis, jaundice, and multiple blood transfusions.[3]

In cases of twin births, since both babies have the same GA and are exposed to the same pre-natal

conditions, these babies might present a varied ROP disease course depending on various risk factors like BW and other systemic diseases they develop. Thus this study was conducted to study the profile of ROP in twin babies.

Aim of the study

To study the profile of ROP in twin babies.

MATERIAL AND METHODS

Inclusion Criteria

All preterm twin babies irrespective of ultimate development of ROP.

Exclusion Criteria

Neonates with incomplete clinical data and those deceased before the completion of ROP screening were excluded.

The study was a hospital based prospective interventional study. A total of 100preterm neonates satisfying the inclusion criteria were included in the study. Preterm babies with GA of less than or equal to 32wks or BW of less than or equal to 1500gm admitted to NICU in Vanivilas Hospital attached to Bangalore Medical College& Research Institute were included in the study. The duration of the study was from November 2016 to May 2018. As soon as the baby fulfilling inclusion criteria who was admitted to NICU, the details were entered in a predesigned proforma which includes assessment of the risk factors. Informed consent was taken from the parents and baseline data were collected for each baby regarding date of birth, sex, single or multiple births, intrauterine growth retardation and other antenatal insults and other identifiable risk factors were noted like apnea, anemia, sepsis, jaundice, and multiple blood transfusions, O2 administration for RDS, PDA.

All the precautions were taken as per the AAP 2013 guidelines. 4.70 Since ROP screening examinations can have short-term effects on blood pressure, heart rate and respiratory function in the premature baby, examinations were kept as short as possible and precautions taken to ensure that emergency situations were dealt with promptly and effectively.

RESULTS

In our 1 and half year study period, total of 130 twin babies (65 pairs) were screened, of these 100babies/50 pairs (76.92%) satisfied the inclusion criteria and were enrolled in the study and in that only 10 twin pairs (20%) developed ROP. In each ROP affected twin pair, only one baby developed ROP (10%), which was significant in our study. Twin 1 and Twin 2 were Categorized according to order of birth. Neonates who developed any stage of ROP were considered as cases and the neonates without ROP were considered as controls.

In our study we found that most commonly identical twins (90%) (p 0.001, significant) affected than non-identical twins, smaller baby (80%) affected more than larger baby (p 0.007, significant), Male babies (70%) affected more than female babies (p 0.07), ROP development between 2nd born (60%) and 1st born was 6:4 (p 0.37). With regarding to laterality both eyes affected in all 10 babies and stage and zone of affection remains same in both the eyes. Of these 10 pairs with asymmetric ROP, one baby in each 6 twin pairs (60%) had Zone2 Stage1 ROP, one baby in each 3 twin pair (30%) had Zone2 Stage2 ROP with plus disease & one baby in 1 twin pair (10%) had APROP in Zone2 with plus disease. Of these ROP affected babies in 10 pairs, 3 twin pair with Zone2 Stage2 ROP with plus disease in both the eyes underwent laser and regressed; one twin pair with APROP received ANTI-VEGF & regressed. 6 twin pairs with Zone2 Stage1 ROP received no intervention and regressed spontaneously.

Table 1: Comparison of ROP Development Between Male Baby and Female Baby in Twin Pairs

	Male baby	Female baby
ROP	7(70%)	3 (30%)
Without ROP	3 (30%)	7(70%)
Total	10 (100%)	10 (100%)
Chi-square value- 3.2		
p value- 0.07		

Out of 10 babies with ROP 7(70%) babies were male & 3 (30%) babies were female.

Table 2: Comparison of ROP Development Between Identical Twins Versus Non-Identical Twins

	Identical twins	Non-identical twins
ROP	9(90%)	1(10%)
Without ROP	1(10%)	9(90%)
Total	10 (100%)	10 (100%)
Chi-square value- 9.8		
p value- 0.001*		

9 out of 10 (90%) babies were identical twins. and correlation was statistically significant (p value 0.001).

Table 3: Distribution of the Subjects Based on Stage and Zone of ROP

	Stage and Zone	Frequency	Percent
	ZONE 2,STAGE1	6	60.0

ROP	ZONE 2,STAGE2 WITH PLUS	3	30.0
	APROP WITH PLUS	1	10.0
	Total	10	100.0

6 out of 10 babies had zone 2, stage 1 ROP (60%) ,3 out of 10 babies had zone 2, stage2 ROP with plus disease (30%) & 1 baby had APROP (10%).

Table 4: Distribution of The Subjects Based On Plus Disease

PLUS	Frequency	Percent
Negative	6	60.0
Positive	4	40.0
Total	10	100.0

4 babies (40%) with ROP had plus disease & 6 babies (60%) without plus disease.

Table 5: Distribution of The Subjects Based On Treatment

		Frequency	Percent
ROP	Nil	6	60.0
	ANTI-VEGF	1	10.0
	Laser/YES	3	30.0
	Total	0	100.0

Out of 10 ROP cases, 3 babies (30%) received Laser treatment, 1 baby (10%) received Anti-VEGF & 6 babies were observed (60%). On follow-up of these babies for 3 months, there was no progression in course of ROP. also in our study we observed that none of the other baby in the same twin pair did not develop ROP throughout the study.

DISCUSSION

Significance of ROP screening lies in the fact that ROP is the most common cause of childhood blindness which is preventable under NPCB.

According to the study conducted by Gilbert C and Foster A, it has been agreed that ROP screening in VLBW (very low birth weight) twins may be conducted according to the same standard protocols as for singletons.[5]

Azad R et al conducted study on profile of asymmetrical retinopathy of prematurity in twins and concluded that screening of all babies is necessary in cases of multiple births and birth weight alone cannot be relied upon as a single factor to predict the severity and course of ROP.[1]

Twins provide a good study model since they have the same GA and are exposed to the same prenatal risk factors. Thus, it helps us to analyze the role of systemic complications in development and progression of ROP in two premature babies exposed to same risk factors.

In our study of twin babies, out of 50 pairs, only 10 pairs developed ROP (20%). In each ROP affected twin pair, only one baby developed ROP, which was significant in our study.

In our study, we compared the profile of ROP in twin babies& we found that 4 out of 10 babies (40%) with ROP were 1st born, 6 out of 10 babies (60%) were 2nd born and the correlation were statistically insignificant (p value 0.37).

We also studied the development of ROP between male and female babies.

7 out of 10 babies (70%) were male babies & 3 out of 10 babies were female babies. Development of ROP was more in male babies than female babies correlation were statistically significant (p value 0.007).

9 out of 10babies (90%) who developed ROP were identical twins,1outof

10 baby was a non-identical twin & correlation between these two were statistically significant (p value 0.001).

Sanghi G et al. conducted a retrospective study from 2004 to 2008, on inter- sibling variability of retinopathy of prematurity in twins and its risk factors.

35 twin pairs developed ROP of which 28 pairs (80%) had inter-sibling variability and thus concluded that birth order, birth weight and post-gestational factors were not able to predict the variable severity of ROP in twins.[6]

But in our study there were differences in presentation of ROP in twins, the 2nd order baby developed ROP (60%).

Gordan SK, Yau et al conducted a retrospective study for retinopathy of prematurity development in paired twins, a Chinese population study from 2007 to 2012 and concluded that in Chinese twin pairs, smaller GA was the only common risk factor for ROP.[7]

In our study, 6 babies (60%) developed Zone-2 stage-1 ROP, 3 babies (30%) developed Zone-2 Stage-2 ROP with plus disease & one baby (10%) developed Zone-2 APROP with plus disease.

Of these ROP affected babies among 10 pairs, 3 twin pair with Zone-2 Stage-2 ROP with plus disease underwent laser in both the eyes and regressed; one twin pair with APROP received ANTI-VEGF & regressed. 6 twin pairs with Zone-2 Stage-1 ROP received no intervention and regressed spontaneously.

Though major portion of cases of ROP regresses spontaneously, they can go for long term complications like late occurrence of angle closure glaucoma and retinal detachment. They are also at risk of developing strabismus, high myopia and amblyopia early in life.[8]

Limitations of the Study

1. The sample size is small. Hence, a larger multi-centric study over a longer duration of period is required to establish the additional risk factors associated with ROP in a developing country like India.
2. Lack of long term follow up to assess future ophthalmological sequelae including myopia, cataract, squint and other long term complications associated of ROP.

CONCLUSION

This study reinforces the fact that screening of all babies is necessary in cases of multiple births. Gestational age and BW alone cannot be relied upon as a single factor to predict the severity and course of ROP, as even additional risk factors can lead to the development of ROP which may present with variable course.

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