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Journal of Clinical & Experimental Ophthalmology

Research Article

A Dissimilarity on Examination amongst Twins for Retinopathy of Prematurity Screening: An Observation

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ABSTRACT

Background: Retinopathy of Prematurity (ROP) is a vasoproliferative disease of retina in premature babies. The development of ROP occurs due to several risk factors like prematurity, low Birth Weight (BW) and systemic derangements like respiratory distress, anaemia, sepsis, cholestasis, ABO incompatibility and treatments such as phototherapy and multiple blood transfusions.

Aim: To understand the cause of asymmetric ROP in twins.

Material and methods: We reviewed the records of 13 pairs of twins with ROP diagnosed at our centre retrospectively. We surveyed the pairs for risk factors that must have led to the disease.

Results: An observation of 13 pairs of twins having ROP showed the average GA was 29.69 weeks and average BW was 1282.692 gm. In 2 pairs of twins, ROP was symmetric in both eyes with respect to zone and staging. Of these 2 pairs of twins with symmetric ROP, treatment was not required. Of the treated eyes, one progressed to higher stages after laser treatment rest progressed due to non-availability of treatment and transport during pandemic.

Discussion: It was a documented fact that post-natal factors can solely be responsible for occurrence of ROP. It has been documented that ROP screening in twins to be done cautiously as twin pregnancy is already an established risk factor for development of ROP. Nonetheless, irrespective of the gestational age and birth weight decision regarding whether the screening should be done or not is totally depends on how sick the child is. Severe forms of ROP have been documented in full term heavier neonates.

Conclusion: In conclusion, the complex mechanisms which lead to the development of this crippling disease in neonates are still need to be understood.

Keywords: Retinopathy of Prematurity (ROP); Laser Indirect Ophthalmoscopy (LIO); Vascular Endothelial Growth Factors (Anti-VEGF)

INTRODUCTION

Retinopathy of Prematurity (ROP) is a vasoproliferative disease of retina in premature babies. The development of ROP occurs due to several risk factors like prematurity, low Birth Weight (BW) and systemic derangements like respiratory distress, anaemia, sepsis, cholestasis, ABO incompatibility and treatments such as phototherapy and multiple blood transfusions [1].

In twin babies, as both the babies have identical gestational age and have experienced the same pre-natal conditions; but developed different stages of ROP purely depending upon their systemic control, birth weight and therapies received. Therefore, when we study a twin pair for presence of ROP and its course, it can help us understand better, the contribution of other factors in the development of the disease and its progression [2].

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Received date: October 22, 2021; **Accepted date:** November 05, 2021; **Published date:** November 12, 2021

Citation: Adrian B, Nathan C (2021) Dissimilarity on Examination Amongst Twins for Retinopathy of Prematurity Screening: An Observation. J Clin Exp Ophthalmol. 12:895.

Aim

To understand the causes of asymmetric ROP in twins.

METHODS

We reviewed the records of 13 pairs of twins with ROP diagnosed at our centre retrospectively. We surveyed the pairs for risk factors and final outcome of the disease. We looked for dissimilarity in staging, zones, progression, regression, treatment, and outcome. The disease was labelled as asymmetrical if there was a difference of one zone or two stages in the worst eyes. All pair were screened and managed as per revisited international committee of retinopathy of prematurity guidelines [2,3]. Zone and stage mentioned in table indicate most severe zone or stage reached anytime during follow-up.

RESULTS

Results in the buckle group

An observation of 13 pairs of twins having ROP showed the average GA was 29.69 weeks and average BW was 1282.692 grams. In 2 pairs of twins, ROP was symmetric in both eyes with respect to zone and staging. Of these 2 pairs of twins with symmetric ROP, treatment was not required. Of the treated eyes, one progressed to higher stages after laser treatment rest progressed due to non-availability of treatment and transport during pandemic.

Total 11 pairs had a difference of at least 1 zone or 2 staging and were considered asymmetric in the study. No correlation with birth weight has been found in this study although the sicker neonate had more severe forms of ROP. After additional observation risk factors like sepsis, multiple blood transfusion, neonatal cholestasis and respiratory distress syndrome were identified as probable factors which can lead to the disease (Table 1). There was also no significant difference in birth weights of the two babies in a pair who have had severe ROP.

DISCUSSION

It was a documented fact that post-natal factors can solely be responsible for occurrence of ROP. It has been documented that ROP screening in twins to be done cautiously as twin pregnancy is already an established risk factor for development of ROP [4]. Nonetheless, irrespective of the gestational age and birth weight, decision regarding whether the screening should be done or not, should totally depend on how sick the child is various forms of ROP has been documented in near term heavier neonates [5,6]. Closely observing a twin pair is literally critical in determining the postnatal factors which must have pushed the infant for development of the disease as both the infants comprise of same genetic and prenatal makeup with same gestational age, the only difference being the postnatal status and sometimes very insignificant difference in birth weight too which proves the role of other risk factors.

In this study it has been observed that the new-born twins can have variable course of the disease and progression. The twins can vary in need of treatment and outcome at times. This lead to quite peculiar information that ROP is an unpredictable disease and in this era of constant development we cannot afford to misdiagnose the cases. It has been observed in multiple studies that ROP can not necessarily be the same in two new-borns born out of same gestation with same genetic constitution. It can vary in presentation, clinical course, need for treatment and outcome. The need of the hour is that every ophthalmologist should keep in mind that not only the gestational age, birth weight can lead to development of the disease but also the postnatal insult to the new-born in the form hemodynamic instability, sepsis, therapeutics and handling are responsible for development of the disease. It should be kept in mind that the kind of stress the new-born has been through, to dedicatedly screen and establish the diagnosis. We could minimise the missed cases if we look beyond the gestational age and birth weight of the infant.

Table 1: Most severe zone or stage reached anytime during follow-up.

Twin pair no	Twin	Gender	Ga	Bw	Risk factors	Re zone	Re staging	Re treatment	Re outcome	Le zone	Le staging	Le treatment	Le outcome
1	A	F	32	1500	Neonatal cholestasis	3	1	Followup	Regressed	3	2	Followup	Regressed
	B	F	32	1000	Neonatal cholestasis	3	1	Followup	Regressed	3	1	Followup	Regresses
2	A	M	32	1600	Oxygen therapy	3	2	Followup	Regressed	3	1	Followup	Regressed
	B	M	32	1200	Sepsis	3	1	Followup	Regressed	3	1	Followup	Regressed
3	A	M	28	1600	Oxygen therapy	1	2	Followup	Regressed	3	1	Followup	Regressed
	B	F	28	1200	Sepsis	1	2	Followup	Regressed	3	1	Followup	Regressed
4	A	M	32	1400	Respiratory distress	2	1	Followup	Regressed	2	1	Followup	Regressed
	B	M	32	1400	Oxygen therapy	2	1	Followup	Regressed	3	1	Followup	Regressed
5	A	M	32	1400	Respiratory distress	3	3	Lio	Regressed after laser augmentation	2	1	Followup	Regressed

	B	F	32	1500	Oxygen therapy	3	2	Followup	Regressed	2	3	Lio	Regressed after laser augmentation
6	A	M	28	750	Anaemia	1	3	Lio	Loss to Followup	2	1	Followup	Loss to followup
	B	F	28	1000	Sepsis	1	2	Folloup	Death	2	1	Followup	Death
7	A	F	28	1400	Neonatal jaundice	1	2	Followup	Regressed	1	4	Referred	Progressed
	B	F	28	1500	Anaemia	1	2	Followup	Regressed	1	1	Followup	Regressed
8	A	M	30	1000	Fungal sepsis	1	3	Lio	Regressed	1	5	Referred	Loss to followup
	B	M	30	1200	Pneumonia	1	2	Followup	Regressed	1	3	Antivegf	Regressed
9	A	F	28	1600	Respiratory distress	1	2	Followup	Regressed	1	3	Antivegf	Regressed
	B	M	28	1200	Phototherapy	1	2	Followup	Regressed	1	2	Followup	Regressed
10	A	F	28	1200	Anaemia	1	3	Lio	Regressed	1	5	Referred	Loss to followup
	B	M	28	1000	Respiratory distress	1	2	Followup	Regressed	1	1	Followup	Loss to followup
11	A	F	28	1300	Respiratory distress	1	2	Followup	Regressed	1	2	Followup	Regressed
	B	F	28	1000	Intrauterine growth restriction	1	2	Followup	Regressed	1	2	Followup	Regressed
12	A	F	32	1400	Blood transfusion	1	2	Followup	Regressed	1	1	Followup	Regressed
	B	M	32	1600	Oxygen therapy	1	2	Followup	Regressed	1	1	Followup	Regressed
13	A	M	28	1000	Blood transfusion	1	3	Lio	Progressed	2	3	Lio	Regressed
	B	F	28	800	Intrauterine growth restriction	1	4	Referred	Progressed	1	5	Referred	Progressed

Abbreviations: ROP: Retinopathy of Prematurity; LIO: Laser Indirect Ophthalmoscopy; Anti-VEGF: Anti Vascular Endothelial Growth Factors; BW: Birth Weight; GA: Gestational Age; Re: Right eye; Le: Left eye

Therefore it is important to see the sick child frequently with a healthy sibling and do follow-up both neonates regularly as per screening guidelines. It is important in country like India where the parents are unaware of the severity of the disease and do not believe in frequent follow-up of the new-borns. The parents in developing countries for their own convenience due to lack of resources and correct information assume that the disease will regress on its own. This lead to loss to follow-up and later more complicated cases arise which lead to increase in prevalence of inoperable ROP.

We have also observed that in multiple documented studies the heavier neonate developed more severe forms of the disease while we used to keep that in mind that the lighter baby is more prone for the disease.

CONCLUSION

In conclusion, the complex mechanisms which lead to the development of this crippling disease in neonates are still need to be understood. To analyse those factors really responsible for causing this disease, it might need a larger sample size and thorough observation in a controlled environment. The limitation of this study was a small sample size and short term follow-up with relatively less attention to additional risk factors. Only gross derangements were considered in this study further improvements should be made in the follow-up studies keeping in mind the question "do ROP improves with improvement of hemodynamic stability and decrease in metabolic stress levels in infants"

The future scope in this matter is never ending and we should work towards establishing the ultimate factor responsible for this disease which can lead to better preventive measures.

DECLARATIONS

Conflict of interest: none

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