Original Article

Role of routine screening for retinopathy of prematurity in new born upto 2kg of weight and/or less than 37 weeks of gestation

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Abstract

With the increasing survival of preterm and low birth weight babies in India, due to improved neonatal care and better neonatal Intensive care facilities available, incidence of Retinopathy of prematurity is increasing with more awareness of this condition among general population, pediatricians and ophthalmologists. Routine Ophthalmic checkup was advised in babies upto 1.5 kg of weight and/or below 34 weeks of gestation, however there have been cases reported of babies of weight of between 1.5 to 2.0 kg and gestational age of upto 37 weeks that have had Retinopathy of Prematurity. So, the present study helps to determine the Role of routine screening for Retinopathy of Prematurity in new born upto 2kg of weight and/or less than 37 weeks of gestation. **Method:** It is a clinical study of all neonates less than 2.0 kg of weight and/or less than 37 weeks of post gestational age at tertiary care center, Karad from November 2014 to may 2016. **Results:** Of the 120 neonates screened, 64 were males (53.33°.) and 56 were females (46.67%). Among the neonates who developed ROP. 23 were males (28.57%) and 18 were females (71 .42%). **Conclusion:** In our study 7 neonates with birth weight of more than 1500 gms and less than 2000gms and gestational age between 34 weeks to 37 weeks were found to have ROP which under normal screening protocols would have been missed.

Keywords: Retinopathy of prematurity (ROP), Prematurity, Low birth weight , Retrolental Fibroplasia

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INTRODUCTION

Retinopathy of prematurity (ROP) was originally named Retrolental fibroplasias. The enigmatic finding of the disease was associated with scar tissue behind neonate lens associated with retinal detachment on which intensive studies were conducted during 1950s to 1970s[1].In Boston in Feb 1941 two premature infants each weighing 1kg in weight were born with nystagmus, almost flat anterior chambers, grayish red reflex and gray membranes with blood vessel on the back surface of both lenses. These infants were at the forefront of blindness epidemic that extended over the next 15 years. This became to be known as Retrolental Fibroplasia (RLF) epidemic in reference to the scar tissue that developed behind the lens[2].From 1942 through 1945, Terry[1-6] followed infants with RLF and reported on 117 who had this new disease. The term RLF according to Silverman originated in 1944 with Dr. Harry Messenger, a Boston Ophthalmologist. Terry theorized that the problem is derived from the persistent and overgrowth of components of the embryonic hyaloid vascular system. It was terry who first raised the possibility of extreme prematurity itself as being responsible for the malady. In 1946, Reese and Payne observed RLF in both premature and full term infants. In 1948 and 1949, Owens and owens[7-9]first described RLF in serial stages of (i) dilated and tortous retinal blood vessels, (ii) retinal elevation more peripherally (iii) further elevated retina with a membrane at the edge of the field and (iv) complete retrolental membrane with blood vessels over the totally

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detached retina, and stated that RLF was a postnatal vascular retinopathy with neo-vascularization and its secondary complications.The term ROP was coined by Heath in 1951[10].He was much more precise in his descriptions and his histo-pathological studies offered rare insight into the disease process as it was then understood.In 1951, Campbell suggested that toxic effects of uncontrolled oxygen to new born were responsible for epidemic. She suggested avoiding use of oxygen and use only if the child is cyanosed[10].During the late 1970s and 1980s resurgence of ROP was noted and called the second epidemic due to increased survival of very low birth weight infants(750- 999gms)[10].In 1981, Phelps estimated the incidence of ROP associated with an increase in survival rates of infants with birth weight of less than 1.0 kg[10].In 1983, International Classification of Retinopathy Of Prematurity was devised under the leadership of john Flynn[11].However more recent reports indicate a decline in the incidence, severity and progression to threshold disease in developed countries[12].

METHOD

It is a clinical study of all neonatesless than 2.0 kg of weight and/or less than 37 weeks of post gestational age at tertiary care center, Karad from November 2014 to may 2016.

RESULTS

Of the 120 neonates screened, 64 were males (53.33%) and 56 were females (46.67%). Among the neonates who developed ROP. 23 were males (28.57%) and 18 were females (71 .42%). No statistically significant correlation could be found. Of the 41 neonates who were found to have ROP, 16 neonates were in stage 1 (39.02%). 20 in stage 2 (48.78%) and 3 in APROP (12.19%) of the disease Total incidence of ROP in this study was found to be 34.17%.

92.68% were in stage 1 or 2 of the disease. The percentage of neonates who had ROP in the gestational age group 28-32 weeks was 44.4% and was 25.75% in the 32-36 weeks gestational age group. There exists significant correlation between birth weight and prematurity. Also present study shows significant correlation with oxygen supplementation (28 neonates were ROP positive out of 58 who received oxygen).RDS (33 were positive in 51 who were having RDS). Surfactant (10 ROP positive out of 46 who received surfactant). There exists no significant correlation with cyanosis (1 ROP positive out of 9 having cyanosis).septicemia (5 ROP positive out of 18 having septicaemia). Apnoea (7 ROP positive babies were protected whose mother's were received dexarnethasone during pregnancy). There exists no significant correlation with cyanosis (1 ROP positive out of 9 having cyanosis).septicaemia (5 ROP positive out of 18 having septicaemia).Apnoea (7 ROP positive out of 16 having apnoea). Exchange transfusion (7 ROP positive out of 12 having received exchange transfusion). Anaemia (6 ROP positive out of 15 having anaemia).PDA other malformations, hypcrbilirubinemia(10 ROP positive out of 19). Phototherapy (10 ROP positive out of 19). Dopamine (1 ROP positive out of 11). Maternal hypertension (4 ROP positive out of 14). Neonates who had APROP and stage 2 plus disease received laser photocoagulation. Rest resolved spontaneously.

Table 1: Sex distribution

Gender	Male	Female
ROP(+)	23	18
ROP(-)	41	38

Table 2: Gestational Age (GA) and ROP

	GA 28-32 weeks	GA 32-37 weeks	Total
ROP +ve	24(44.4%)	17(25.75%)	41(34.17%)
ROP –ve	30(55.60%)	49(74.78%)	79(65.83%)

χ^2=4.20, p<0.05, statistically significant

Table 3: Birth weight in grams

	751-1000gms	1001-1250gms	1251-1500gms	1501-1750gms	1751-2000gms
ROP +ve	5	13	16	5	2
ROP –ve	2	2	22	23	30
Total	**7**	**15**	**38**	**28**	**32**

χ^2=16.0467, p<0.0001, statically significant

Table 4: RDS and ROP

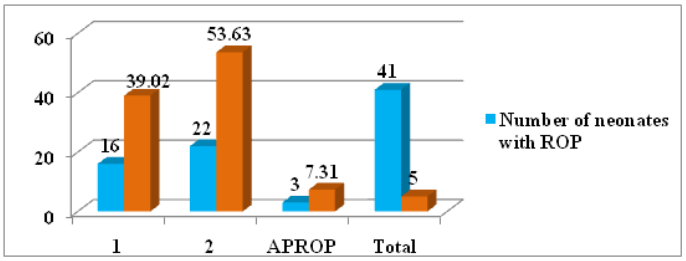
	RDS present	RDS not present	Total
ROP +ve	33	8	41
ROP –ve	18	61	79

χ^2=36.77. p<0.001, statistically significant

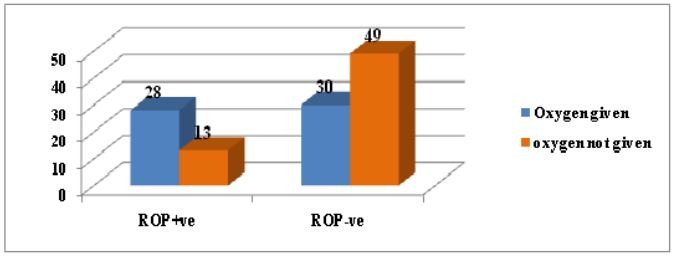
Table 21: Surfactant and ROP

	Surfactant given	Surfactant not given	Total
ROP +ve	10	31	41
ROP –ve	36	43	79

X^2=5.12, p<0.05 significant



Graph 1: Incidence of ROP (out of 120 neonates screened)



Graph 2: Supplemental Oxygen and ROP

DISCUSSION

Of the 120 neonates screened, 64 were males (53.33°.) and 56 were females (46.67%). Among the neonates who developed ROP. 23 were males (28.57%) and 18 were females (71 .42%). No statistically significant correlation could be found. Of the 41 neonates who were found to have ROP, 16 neonates were in stage 1 (39.02%). 20 in stage 2 (48.78%) and 3 in APROP (12.19%) of the disease Total incidence of ROP in this study was found to be 34.17%. The incidence of ROP showed a significant statistical correlation with prematurity on performing the chi square test. Interestingly, of the 54 neonates who fell in the 28-32 weeks GA group, 24(44.44%) had ROP while 17 out of the remaining 66 neonates (25.75%) who had ROP fell in the 32-36 weeks GA group. This showed that the percentage of neonates who had ROP was higher in the younger age group while the majority who did not have ROP was in the older age group All the neonates with APROP disease were of 28 weeks GA showing a more severe form of disease in lower age groups. One of the major ROP risk factors is birth weight. The lesser the birth weight, greater are the chances of developing ROP. Our study showed statistically significant correlation between birth weight and ROP by Rigid analysis.

According to our study, theincidence of ROP with respect to the various birth weight groups are as follows:

751-1000 gms 12.19%, 1001-1250 gms 31.70%, 1251-1500 gms. 39.02%, 1501-2000 gms.4.87%

This shows that there is very high significant correlation between birth weight and ROP. This has been supported by Multicenter Trial of Cryotherapy which showed that lower the birth weight. Greater the risk of developing ROP especially at birth weights less than 750 gms.One would also be surprised as the birth weight between 1251-1500 gms in our study has the highest percentage of ROP, this can only be attributed to one cause that less birth weight babies most often do not survive and the paediatrician is more tilted towards saving the infant's life rather than getting him/her screened for ROP. In our study there is very highly significant correlation between oxygen supplementation and ROP. This has been supported by studies done by Flynn *et al* and Chaudhari *et al*

In our study there is very highly significant correlation between RDS and ROP the same has been supported by studies done by Ebrahim M *et al*. Several other factors associated with ROP like cyanosis, apnoea. Exchange transfusion. Septicaemia, anemia, patent ductus arteriosus and other malformations, hypebilirubineimia phototherapy, dopamine administration and maternal risk factors like hypertension, diabetes mellitus and infections, were also considered in this study. None of the above factors showed any statistically significant correlation with the development of ROP.

CONCLUSION

In our study 7 neonates with birth weight of more than 1500 gms and less than 2000gms and gestational age between 34 weeks to 37 weeks were found to have ROP which under normal screening protocols would have been missed. Babies in developing countries having low birth weight and/or preterm should be screened for ROP as it is a avoidable cause of blindness.ROP currently is in its third epidemic state and all babies who come under low birth weight category and /or preterm should be thoroughly screened, especially in developing countries. As per the paediatric definition of low birth weight (babies less than 2.5kg weight) and preterm(less than 37 weeks of gestation), babies should be screened as there have been instances of such infants having found out to have Retinopathy of Prematurity.

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