PREVALENCE OF RETINOPATHY OF PREMATURITY IN PREMATURE INFANTS

Dr. Sukriti Gupta[1], Dr. Sarita Aggarwal[2], Dr. Manan Kaushik[3], Dr. Suman Singh[4], Dr. Kashish Goel[5], Dr. Gagandeep Kaur[6]

SANTOSH DEEMED TO BE UNIVERSITY NO. 1,
SANTOSH NAGAR,
GHAZIABAD-201009, NCR DELHI, INDIA

DEPARTMENT OF OPHTHALMOLOGY SANTOSH MEDICAL COLLEGE & HOSPITAL GHAZIABAD, NCR DELHI

1. **Main Author** – Dr. Sukriti Gupta, Post graduate 3rd year, Dept. of Ophthalmology, Santosh Medical College & Hospital, Ghaziabad, India

2. **Corresponding author** – Dr. Sarita Aggarwal, Professor & HOD, Dept. of Ophthalmology, Santosh Medical College & Hospital, Ghaziabad, India

Co-authors

3. **Co-author-** Dr. Manan Kaushik, Assistant Professor, Dept. of Ophthalmology, Santosh Medical College & Hospital, Ghaziabad, India

4. **Co-author-** Dr. Suman Singh, Post graduate 2nd year, Dept. of Ophthalmology, Santosh Medical College & Hospital, Ghaziabad, India

5. **Co-author-** Dr. Kashish Goel, Post graduate 2nd year, Dept. of Ophthalmology, Santosh Medical College & Hospital, Ghaziabad, India

6. **Co-author-** Dr. Gangandeep Kaur, Post graduate 1st year, Dept. of Ophthalmology, Santosh Medical College & Hospital, Ghaziabad, India

DOI: 10.31838/ecb/2023.12.si3.415

ABSTRACT

Preterm birth can impose challenges on the developing ocular system, resulting in the various visual manifestations of varied significance and pathological scope. This ocular condition can pose severe vision loss. Retinopathy of Prematurity is a bilateral proliferative retinopathy, which occurs in premature infants with low birth weight who often have been exposed to higher concentrations of oxygen & effects the developing retinal blood vessels. A Hospital based cross sectional study of 50 premature infants admitted to the specialized neonatal care unit and attending the eye out patient department having gestational age < 32 weeks & birth weight <1500 grams over a period of one year was done. All the new born were examined. Risk factors such as gestational age, birth weight, history of oxygen therapy & ventilation, apnoea, anaemia, blood & blood product transfusion were assessed. A total of 50 premature infants were examined. Prevalence of Retinopathy of Prematurity was found to be 8% (n= 04), the majority of whom 58% (n=29) were male, 50% (n=2) had Stage II Retinopathy. Of the infants having weighed <1500gm. Prevalent postnatal risk factors included oxygen therapy 7.14%, apnoea 40%, anaemia 66.66%, 50% infants who received ventilation & blood transfusion also developed Retinopathy of Prematurity. Retinopathy of prematurity the commonest and more preventable form of blindness. The purpose of the study is to know the prevalence of Retinopathy of Prematurity in extreme low birth weight as it is the most significant problem. To minimize development

of complications such as myopia, temporal vitreoretinal fibrosis with dragging of the disc/extensive retrolental fibrovascular tissue, secondary angle closure glaucoma, total retinal detachment.

Keywords- ROP, Retinopathy of Prematurity, Premature infant, oxygen therapy

INTRODUCTION

Retinopathy of prematurity (ROP), or retrolental fibroplasias as it was originally named, had life span as a 20th century disease. Over the previous 59 years this disease was first correlated with prematurity by Terry in 1942, a plethora of literature has emerged on retrolental fibroplasia (RLF) and ROP (Terry TL 1942). ROP is a bilateral proliferative retinopathy, which occurs in premature infants with low birth weight (LBW) who often have been exposed to higher concentrations of oxygen & effects the developing retinal blood vessels. It emerges out as one of the leading causes of preventable blindness and accounts for up to 10% of childhood blindness in developed countries (Goggin M et al 1991). Its prevalence in moderately developed countries human development index (HDI) (30-100) is as high as 60% in premature babies & in poorly developed countries, which includes India, is 3 to 13%. The incidence in highly developed countries, those with a HDI of 1-3% is 3- 13. Its incidence is higher in babies of low gestational age and LBW (Bossi E et al 1995, Keith CG et al 1995). Major risk factors of ROP include hyperoxia, sepsis, blood transfusions, acidosis, antioxidant deficiency, patent ductus arteriosus, apnoea and intraventricular haemorrhage. ROP can be prevented by a simple screening test done within a few weeks after birth (Jalali S et al 2014). In India, ROP screening should be done in all preterm neonates who are born <34 weeks of gestation and/or <1750 g birth weight; as well as in babies 34-36 weeks of gestation or 1750-2000 g birth weight if they have risk factors for ROP. Screening should start by one month after birth, as early as 2-3 weeks of age in infants born <28 week or <1200g birth weight (Hack M et al 2005). The overall extremely low birth weight (ELBW) (<1000gms) infants are three times more likely to have a vision of less than 6/60 than those born at term (Parag K Shah et al). The treatment should be done at the earliest, preferably within 24 hours and not later than 72 hours. It is recognized on the retinal ablation theory. It targets the avascular region of the retina with the intention of reducing angiogenic growth factor production (Ng EY et al 2002). The treatment of choice for ROP is peripheral diode laser photocoagulation (Ng EY et al 2002, Connolly BP 2002).

MATERIAL AND METHODS

The study was approved by ethical committee of University. This cross-sectional study was conducted between August 2020-August 2021. Study included total 50 premature infants having gestational age of less than 32 weeks. All new born admitted to Santosh Hospital and babies attending to eye OPD were screened for ROP. Data including demographic profile, birth weight, gestational age, history of anaemia, apnoea, oxygen therapy, ventilation & blood & blood product transfusion were recorded. A fixed time was arranged for screening. Parents of admitted cases were pre informed and consent taken. Proper history was taken. Dilatation was done 15- 20 minutes before examination.

Babies were evaluated in temperature controlled clean environment where risk of hypothermia, infection, and apnea were minimum. For patient in NICU the screening was done in open case system incubation. The child was fed and burped an hour before the examination to minimize the risk of vomiting.

The anterior segment was first evaluated with torchlight and pupillary reactions were noted. The neonates were examined without sedation. Pupils were adequately dilated with 0.5% tropicamide and 2.5% phenylephrine instilled twice, 20 min before evaluation. Smallest size wire speculum was used to retract the lids. Screening of ROP was done by indirect ophthalmoscopic examination of retina and anterior segment using VOLK +20 D lens.

Babies were comfortably wrapped & placed flat on examination surface. An assistant restrained babies' arms & stabilize the head.

First the anterior segment was evaluated with +20D lens under illumination of Indirect ophthalmoscope for any rubeosis, persistent tunica vasculosa lentis and congenital ocular abnormalities. Staging was performed using international classification.

Once treatable stage of ROP was detected parents were contacted and with consent treatment was done. Babies which were having fully vascularized retina were not called for follow up examinations. Babies who were having immature retina or having any stage ROP were called for follow up examination depending on the severity of ROP. Babies who were having stage 3 ROP in zone 1, stage 2 or 3 ROP in zone 2 with plus disease were advised treatment.

ETHICAL APPROVAL

Ethical approval was taken by the ethical committee of the medical college and hospital.

STATISTICAL ANALYSIS

The data was collected and entered in MS excel (latest version). All the data was represented in the form of number and percentages. Graphical representation of the variable was shown to understand the results clearly and to measure the association for categorical dataset was analyzed using appropriate Test.

RESULTS

The study was conducted from August 2020-August 2021. During the study period a total of 50 babies were screened for ROP and 04 (8%) of them turned out to be positive.

TABLE 1: (GENDER DISTRIBUTION)

It is observed from the present study that the majority 29 (58%) babies were males, remaining 21 (42%) babies were females.

TABLE 2. (GESTATIONAL AGE AND ROP)

Majority of cases of ROP occurred between 28-30 weeks (n=03,17.63%) of gestation. In 30-32 weeks of gestation 1(3.03%) case of ROP was seen as shown in Table 2. As the gestational age decreased the prevalence of ROP increased.

TABLE 3: (BIRTH WEIGHT AND ROP)

The birth weight ranged from 740 gm to 1500 gm. 20% of cases between 740-1000 gm extremely low birth weight (ELBW) birth weight developed ROP. 6.67% of babies between 1000-1500 gm birth weight developed ROP.

TABLE 4: (SEX DISTRIBUTION AND ROP)

In 04 ROP positive babies there were 2 male babies and 2 female babies as given in Table 4.

TABLE 5: (OXYGEN THERAPY AND ROP OUTCOME)

Out of 42 babies who received oxygen, 7.14% (n=3) of babies developed ROP. 12.5% (n=1) babies who have not received oxygen developed ROP as shown in Table 5.

TABLE 6: (APNEA AND ROP)

Out of 50 cases 5 cases (10%) had apnoea. Out of 13 cases 10 cases (76.9%) had ROP as given in Table 6.

TABLE 7 & 8: (VENTILATION AND ROP & ANEMIA AND ROP)

In 04 ROP positive cases 2 cases (50%) cases had apnoea, 2 babies (4%) received ventilation in which 1 case (50%) had ROP. Out of 04 ROP positive cases 1 cases (25%) received ventilation & 03 babies (6%) had anaemia. Out of 03 babies 2 (66.66%) developed ROP. Out of 04 ROP positive babies 2 (50%) were found to be anaemic as shown in Table 7&8.

TABLE 9: (BLOOD AND BLOOD PRODUCT TRANSFUSION AND ROP)

Out of 50 babies 04 babies (8%) received blood and blood product transfusion. Out of 4 babies 2 babies (50%) developed ROP. Out of 04 ROP positive cases 2 babies (50%) developed ROP as shown in Table 9.

TABLE 10: (FREQUENCY DISTRIBUTION OF STAGES OF ROP)

Out of 04 positive cases 25% cases are in stage 1, 50% are in stage 2, 25% are in Stage 3, none of the cases were found in stage 4, stage 5 & aggressive posterior ROP (APROP).

TABLE 11: (ZONE DISTRIBUTION OF ROP)

ROP distribution was seen to be equal in Zone 1&2 representing 1 baby each (25%). However, Zone 3 ROP, was seen in 2 babies (50%).

TABLE 1: (GENDER DISTRIBUTION)

GENDER	**NO. OF BABIES**	**%**
MALE	29	58
FEMALE	21	42
TOTAL	50	100

TABLE 2. (GESTATIONAL AGE AND ROP)

GESTATIONAL AGE (WEEK)	**POSITIVE CASES**	**%**	**NEGATIVE CASE**	**%**	**TOTAL CASES**	**%**
28-30	3	17.64	14	82.35	17	34
30-32	1	3.03	32	96.96	33	66
TOTAL	4	8	46	92	50	100

TABLE 3: (BIRTH WEIGHT AND ROP)

	POSITIVE		NEGATIVE		TOTAL	
BIRTH WT. (gm)	NO.	%	NO.	%	NO.	%
740-1000	1	20	4	80	5	10
1000-1500	3	6.67	42	93.33	45	90
TOTAL	4	8	46	92	50	100

TABLE 4: (SEX DISTRIBUTION AND ROP)

GENDER	POSITIVE		NEGATIVE		TOTAL	
	NO.	%	NO.	%	NO.	%
MALE	2	6.89	27	93.1	29	58

FEMALE	2	9.52	19	90.47	21	42
TOTAL	4	8	46	92	50	100

TABLE 5: (OXYGEN THERAPY AND ROP OUTCOME)

OXYGEN	POSITIVE		NEGATIVE		TOTAL	
	NO.	%	NO.	%	NO.	%
GIVEN	3	7.14	39	92.85	42	84
NOT GIVEN	1	12.5	7	87.5	8	16
TOTAL	4	8	46	92	50	100

TABLE 6: (APNEA AND ROP)

APNEA	POSITIVE		NEGATIVE		TOTAL	
	NO.	%	NO.	%	NO.	%
PRESENT	2	40	3	60	5	10
ABSENT	2	4.44	43	95.56	45	90
TOTAL	4	8	46	92	50	100

TABLE 7: (VENTILATION AND ROP)

VENTILATION	POSITIVE		NEGATIVE		TOTAL	
	NO.	%	NO.	%	NO.	%
PRESENT	1	50	1	50	2	4
ABSENT	3	6.25	45	93.75	48	96
TOTAL	4	8	46	92	50	100

TABLE 8: (ANEMIA AND ROP)

ANEMIA	POSITIVE		NEGATIVE		TOTAL	
	NO.	%	NO.	%	NO.	%
PRESENT	2	66.66	1	33.34	3	6
ABSENT	2	4.25	45	95.74	47	94
TOTAL	4	8	46	92	50	100

TABLE 9: (BLOOD AND BLOOD PRODUCT TRANSFUSION AND ROP)

BLOOD TRANSFUSION	POSITIVE		NEGATIVE		TOTAL	
	NO.	%	NO.	%	NO.	%
PRESENT	2	50	2	50	4	8

ABSENT	2	4.34	44	95.66	46	92
TOTAL	4	8	46	92	50	100

TABLE 10: (FREQUENCY DISTRIBUTION OF STAGES OF ROP)

STAGES	NO OF CASES
1	1(25%)
2	2(50%)
3	1(25%)
4	NIL
5	NIL
APROP	NIL
TOTAL CASES	4

TABLE 11: (ZONE DISTRIBUTION OF ROP)

ZONE	NO. OF BABIES	%
1	1	25
2	1	25
3	2	50
Total	4	100

DISCUSSION

ROP AND GESTATIONAL AGE-

In this study 50 babies were enrolled with birth weight <1500 gm and gestational age <32 weeks. In this study, the prevalence of ROP was 04 (8%). This was in concurrence with study done by Maheswari et al. in which all babies weighing <1500 gm and a gestational age <35 weeks were screened. (Maheshwari R et al 1996). Rekha S et al screened all babies with birth weight <1500 gm or and gestational age >35weeks. (Rekha S et al 1996). In a recent article, Kaul S et al. (2021) have suggested the same screening criteria, where prevalence was 28% (Kaul S et al 2021). Chaudhari S et al. screened all babies with birth weight <1500 gm and gestation >32 weeks. Infants with birth weight 1501-1800 gms or 33-34 weeks if they had additional risk factors. (Chaudhari S et al 2009). In a study done by Anudeep et al., out of the 65 preterm babies screened, 24 (37%) developed ROP. (Srikanth K et al 2019). Vinekar et al. suggested that the scenario in developing countries is quite different. As compared to infants in Western nation, gestationally "older" new born are more prone to have ROP. (Vinekar A et al 2007). Hence, the application of Western screening guidelines for developing countries has been questioned by Jalali et al. Goble et al. felt that they were screening too many babies for ROP and recommended that babies with birth weight above 1250 g should not be screened. (Chaudhari S et al 2009). In this study the positive cases of ROP in babies with gestational age ≤32 weeks is 8%. In that 28-30 week is 17.64% 30-32 weeks is 3.03% prevalence increased as the gestational age decreased.

ROP AND BIRTH WEIGHT-

In this study the prevalence of ROP is 8% In ELBW (<1000 gm) babies the prevalence is 20%, in babies with birth weight 1000-1500 gm

the prevalence is 6.67%. In the western studies, the prevalence of ROP has been reported to be 28% in less than 1500 gm babies. In the West ROP, at least the threshold variety is not seen in higher birth weight babies. In contrast ROP is seen in larger, bigger birth weight babies in Asia and other developing countries. In South India, threshold ROP has been seen in babies born with 2000 g birth weight. While partly this might reflect the failure of very small infants to thrive, other factors such as perhaps the quality of neonatal care that has led to a decline of ROP in the West is lacking here. However, the birth weights of babies with ROP have fallen quickly due to improvements in neonatal care. A similar swing in the pendulum could be expected to occur in India as well! Nevertheless, it is essential to realize that at least in the present scenario, the cut off birth weight and the gestational ages of babies that need to be screened for ROP need to be higher.

ROP AND OXYGEN THERAPY-

According to this study prolonged oxygen therapy was a significant risk factor. The mean duration of oxygen was significantly higher in the ROP group. This was similarly seen in study done by Abdel et al. in which 172 infants were screened and there was positive association between ROP and oxygen supplementation. (Hakeem AHAA et al 2012). Study done by Rekha S et al. also have shown a similar significance with the duration of oxygen therapy. (Rekha S et al 1996). In a study by Ved Gupta et al. in their centre, Oxygen was an independent risk factor. (Gupta VP et al 1886). In a study done by Chaudhari S et al. Gupta VP et al. oxygen was found to be significantly associated with ROP. (Chaudhari S et al 2009, Gupta VP et al 2004) Study done by Dutta S et al. has concluded that there was no significant association of ROP with oxygen therapy. (Dutta S et al 2004)

ROP AND APNEA-

In this study apnoea found to be significant risk factor. In a study done by Agarwal R et al. in 2002 apnoea came as a significant risk factor. (Aggarwal R et al 2002). In another study by Gupta et al. in 2004 apnoea came as a significant risk factor. (Hakeem AHAA et al 2012). In another study by Chaudhary S et al. in 2009 apnoea came as a significant risk factor. (Chaudhari S et al 2009)

ROP AND VENTILATION-

In this study ventilation found to be highly significant risk factor. In a study done in Iran by Mokhtari MB et al mechanical ventilation came as a significant risk factor (Mokhtari MB et al 2010). In a retrospective study done in Singapore by Shah VA et al has shown that ventilation as a significant risk factor. (Shah VA et al. 2005). In this study anaemia found to be significant risk factor. In another study by Rekha S et al. in 1996 anaemia came as a significant risk factor. (Rekha S et al 1996)

ROP AND BLOOD TRANSFUSION-

In a study done by Li Liu et al. from China, anaemia was a significant risk factor. (Liu L et al 2009). In this study there is a highly significant association between blood and blood products transfusion. In a study done in Brazil by Pinheiro AM et al. there was a significant association between blood transfusion and ROP. (Pinheiro AM et al 2009). In a study done in Egypt by Abdel H.A.A. hakeem et al. there was a significant association between blood transfusion and ROP. (Hakeem AHAA et al 2012). In a study done in Iran by Mojginbayat-Mokhtari et al. there was a significant association between blood transfusion and ROP. (Mokhtari MB et al 2010)

ROP AND STAGES-

Maximum number of babies i.e., 2 (50%) had stage 2 ROP, 1 (25%) baby were having stage I ROP and stage III ROP respectively. No babies had stage 4, 5 APROP. The findings of this study was similar to a study done by Anudeep et al, 30% had stage 1, 37% had stage 2, and 33% had stage 3 (Srikanth K et al 2019).

ROP AND ZONE-

Maximum number of babies i.e., 2 (50%) had ROP in zone 3, 2 (25%) babies had ROP in zone 1 & 2 respectively. This finding was similar to a study done by Crystal Le in which ROP was most commonly seen in Zone III (68%) and Zone II was the second most common (26%) (Ayyala RS et al 2016).

CONCLUSION

ROP is a disorder of developing retinal blood vessels in the premature infant retina. ROP is the commonest and more preventable form of blindness. During the study period of 1 year from August 2020 to August 2021 babies were

screened for ROP in which 04 were found to be positive. The prevalence rate is 8%. ROP is found to be associated with the following risk factors these are oxygen therapy, blood transfusion, ventilation and anaemia. Out of 04 positive babies for ROP 01 baby was <1000 gm and 03 babies were >1000 gm.

FINANCIAL SUPPORT AND SPONSORSHIP

None

CONFLICT OF INTEREST

There are no conflict of interest.

ACKNOWLEDGEMENT

The authors acknowledge with gratitude the contribution of health workers and the patients who participated in this study.

REFERENCES

1) Aggarwal R, Deorari AK, Azad RV, et al. Changing profile of retinopathy of prematurity. J Trop Pediatr 2002;48:239-42.
2) Ayyala RS, Le C, Basani LB, Zurakowski D, Agraharam SG. Retinopathy of prematurity: Incidence, prevalence, risk factors, andoutcomes at a tertiary care center in Telangana. J Clin Ophthalmol Res. 2016;4(3):119–22.
3) Bossi E, Koerner F. Retinopathy of prematurity. Intensive Care Med. 1995;21:241–247.
4) Chaudhari S, Patwardhan V, Vaidya U, Kadam S, Kamat A. Retinopathy of prematurity in a tertiary care center--incidence, risk factors and outcome. Indian Pediatr 2009;46:219-24.
5) Chaudhari S, Patwardhan V, Vaidya U, Kadam S, Kamat A. Retinopathy of prematurity in a tertiary care center--incidence, risk factors and outcome. Indian Pediatr 2009;46:219-24.
6) Connolly BP, Ng EY, mcnamara JA, Regillo CD, Vander JF, Tasman W. A comparison of laser photocoagulation with cryotherapy for threshold Retinopathy of prematurity at 10 years: part 2. Refractive outcome. Ophthalmology. 2002;109(5):936–941.
7) Dutta S, Narang S, Narang A, Dogra M, Gupta A. Risk factors of threshold retinopathy of prematurity. Indian Pediatr 2004;41:665-71.
8) Goggin M, O'Keefe M. Childhood blindness in the Republic of Ireland; a national survey; Br J Ophthalmol 1991; 75:425-449.
9) Gupta VP, Dhaliwal U, Sharma R, Gupta P, Rohatgi J. Retinopathy of prematurity risk factors. Indian J Pediatr 2004;71:887-92.
10) Gupta VP, Dhaliwal U, Sharma R. Retinopathy of prematurity-risk factors. Pediatr Ophthalmol . 1886;71:887–92.
11) Hack M, Taylor HG, Drotar D. Chronic conditions, functional limitations, and special health care needs of school-aged children born with extremely low-birth-weight in the 1990s. JAMA. 2005;294(3):318.
12) Hakeem AHAA, Mohamed GB, Othman MF. Retinopathy of prematurity: A study of incidence and risk factors in NICU of Al-Minya University Hospital in Egypt. J Clin Neonatol. 2012;1(2):76– 76.
13) Jalali S, Anand R, Rani PK, Balakrishnan D. Impact of the day-30 strategy in the disease presentation and outcome of ROP. The Indian Twin Cities ROP report number 3. Indian J Ophthalmol. 2014;62:610– 614.
14) Kaul S, Magdum R, Mohan M, Motwani D, Singh C , Kotecha M , Prevalence and risk factors of retinopathy of prematurity in Western Maharashtra. Indian J Clin Exp Ophthalmol 2021;7(Special Issue):224-228.
15) Keith CG, Doyle LW. Retinopathy of prematurity in extremely low birth weight infants. Pediatrics. 1995;95:42–47.
16) Liu L,Tian T, Zheng CX,Ileana v,Loana A,Tatiana C,Oana R.Risk factors and laser therapy for retinopathy of prematurity in neonatal intensive care unit. World J Pediatr 2009;5[4]:304-307.
17) Maheshwari R, Kumar H, Paul VK, Singh M, Deorari AK, Tiwari HK. Incidence and risk factors of retinopathy of prematurity in a tertiary care newborn unit in New Delhi. Natl Med J India 1996;9:211-4.
18) Mokhtari MB, Pishva N,Attarzadesh A.Incidence and risk factors of retinopathy

among preterm infants in Iran.Iran J Pediatr.2010;20(3):303-307.

19) Ng EY, Connolly BP, mcnamara JA, Regillo CD, Vander JF, Tasman W. A comparison of laser photocoagulation with cryotherapy for threshold retinopathy of prematurity at 10 years: Part 1. Visual function and structural outcome. Ophthalmology. 2002;109:928– 934.
20) Parag K Shah, Vishma Prabhu,Smita S Karandikar, Ratnesh Ranjan, Venkatapathy Narendran, and Narendran Kalpana;Retinopathy of prematurity: Past, present and future; World J Clin Pediatr;2016 Feb 8; 5(1): 35–46.
21) Pinheiro AM,Silva WA.Incidence and risk factors of retinopathy of prematurity in university hospital Onfore Lopes,Brazil.Arq Bras Oftalmol.2009;72(4):451-6.
22) Rekha S, Battu RR. Retinopathy of prematurity: incidence and risk factors. Indian Pediatr 1996;33:999-1003.
23) Shah VA,Yeo CL, Ling YLF, Ho LY. Incidence,Risk factors of Retinopathy of Prematurity Among very low birth weight infants in singapoore.Ann Acad Med Singaore 2005;34:169-178.
24) Srikanth K, Anudeep K, Sindal MD Jha KN. Study of incidence, risk factors, and treat outcomes in retinopathy of prematurity in a tertiary care center TNOA J Ophthalmic Sci Res2019571246.
25) Terry TL. Extreme Prematurity and fibroplastic overgrowth of persistent vascular sheath behind each crystalline lens. Preliminary report. Am J. Ophthalmol 1942; 25: 203-204.
26) Vinekar A, Dogra M, Sangtam T, Narang A, Gupta A. Retinopathy of prematurity in Asian Indian babies weighing greater than 1250 grams at birth: ten year data from a tertiary care center in a developing country. Indian J Ophthalmol 2007; 55: 331-336.