Magnitude of the Problem of Retinopathy of Prematurity. Experience in a Large Maternity Unit with a Medium Size Level-3 Nursery

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This report describes the extent and severity of retinopathy of prematurity (ROP) in a large maternity unit. The screening of 79 preterm babies showed that ophthalmic examinations should become an important part of neonatal care.

Retinopathy of Prematurity (ROP) was first described in the West in the 1950s. With recognition of the role of oxygen therapy in its aetiology, the overall incidence of blinding retinopathy in the West has declined. With improvement in neonatal care and increased survival of pre-term babies in middle-income countries such as Cuba and Latin America there was a second wave of ROP.[1] Vitamin-A deficiency and infections continue to be the major cause of childhood blindness in developing countries like India, but with improvements in neonatal services, the survival rate of low-weight premature babies has improved considerably. In order to avoid an increase in blinding ROP the improvement in paediatric neonatal services needs to be matched with an increase in ophthalmologists trained in screening and treating ROP. While there have been some reports from India of the incidence of ROP in low birth-weight babies,[2-6] no study has assessed the magnitude of the problem in the context of total deliveries. We describe our experience in a prospective study from a unit that undertakes around 6000 deliveries a year.

Materials and Methods

This study was conducted in a tertiary-level referral centre of a metropolitan city, with 30 neonatal beds, six level-3 beds, and three ventilators. The study was conducted over a period of one year from 1 June 1999 through 30 May 2000, and included all hospital deliveries. Babies with both gestational age less than 34 weeks and birth weight less than 1.5 kg were included in the study. The ROP screening was done by a single ophthalmologist (SV).

Screening was done at 33 – 34 weeks postconceptional age. It was performed in the neonatal nursery using a binocular indirect ophthalmoscope and scleral depression. Pupils were dilated using 1% tropicamide and 5% phenylephrine twice at 15-minute intervals. Retinal changes were classified according to the International Classification of Retinopathy of Prematurity (ICROP).[7] Babies with any stage of ROP were followed up till the disease had regressed. Babies discharged from the nursery before their first screening, or those needing follow-up after discharge, were seen in the ophthalmology department during a designated weekly session.

Six eyes needed cryotherapy. This was done in the nursery under paediatrician-administered ketamine anaesthesia.

Results

A total of 6354 babies were delivered over the one-year period. Table 1 shows the number of babies delivered in the year and number of babies with gestational age less than 34 weeks and birth weight less than 1.5kg. Of the 6354 babies, 245 were under 34 weeks gestation and 123 (1.9%) babies with gestational age less than 34 weeks had weights less than 1.5 kg. Forty-four of the 123 babies with birth weight less than 1.5 kg died in the nursery. The 79 surviving babies required ROP screening. Forty four babies were seen once; 26 required between 2 and 4 visits; 9 babies needed 5 visits or more. Thus a total of 167 examinations were done. Table 2 shows the distribution of the babies by gestational age. Seventeen babies were below 28 weeks gestation and none of these babies survived. Table 3 shows the results of the fundus examination in the 79 babies. Thirty eight babies did not have ROP; 7 babies had stage 3 ROP, five babies progressed to threshold ROP and 3 of 5 babies had cryotherapy. Two babies were referred for laser therapy.

Cryotherapy was done in the nursery under paediatrician-administered ketamine anaesthesia. Of the 6 eyes which had cryotherapy, 5 had regression of retinopathy. One eye with zone 1 disease went on to retinal detachment. One baby seen at six months' follow-up was found to be myopic (-6 dioptres in both eyes).

Table 4 shows the number of babies who did not return for follow-up before they were discharged. The data shows that there was more complete follow-up in babies with more severe ROP, than in those with only immature avascular retina. Parent compliance with follow-up instructions seems related to the seriousness of their child's eye condition.

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Table 1. Nursery statistics, 1 June 1999 to 30 May 2000	
Total deliveries	6354
Live Births	6093
Nursery admissions	1836
Gestation below 34 weeks	245
Weight above 1.5 kg but gestation less than 34 weeks	122
Weight less than 1.5 kg but gestation more than 34 weeks	17
Weight less than 1.5kg and gestation less than 34 weeks	123
Deaths in babies below 1.5kg and gestation less than 34 weeks	44

Table 2. Distribution of preterm babies by gestational age	
Gestation <28 weeks	17
28 to 30 weeks	38
30 to 32 weeks	52
32 to 34 weeks	138

Table 3. Results of fundus examination	
Total number of babies examined	79
No ROP	32
Immature Retina	14
Stage I ROP	15
Stage II ROP	11
Stage III ROP	
Prethreshold	2
Threshold	5

Table 4. Patients lost to follow-up after screening before discharge	
Immature retina lost to follow-up before full maturity of retina	8
Stage 1 ROP lost to follow up before full regression	6
Stage II ROP lost to follow-up before full regression	5
Stage III ROP lost to follow-up	Nil

Discussion

The incidence of ROP in Western studies varies from 34.9 –60.1%.[8-10] Indian studies show an incidence of 20% to 46% in babies screened.[3,5] Retinopathy of prematurity was found in 51.89% of babies screened in our study. Pre-term babies with both gestational age less than 34 weeks and birthweight less than 1.5 kg were 1.9% of the total live births in this tertiary level referral hospital. 35% of these small pre-term babies died in the nursery before they reached the age for screening. The remaining 65% needed screening. 0.77% of this cohort of live-born babies had avascular retina or ROP that needed more than one ophthalmic visit. In all, these babies required about 167 examinations. Five babies needed treatment. Each examination of these tiny infants requires 20 minutes or more of skilled ophthalmic care. ROP screening and treatment, in a single such nursery, requires a minimum of half day each week, devoted to this. With an increasing number of hospitals starting intensive neonatal care and improving baby survival, the number of ophthalmologists trained to look after these babies will also need to increase proportionately.

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