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Ocular Abnormalities in Newborn Infants needing Special Care

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Summary

Baiyeroju-Agbeja AM, Omokhodion SI. Ocular Abnormalities in Newborn Infants needing Special Care. *Nigerian Journal of Paediatrics* **1998; 25:49.** A prospective study was carried out over a six-month period to determine the pattern and outcome of ocular abnormalities in newborn infants needing special care. All babies at risk of developing retinopathy of prematurity (ROP) were excluded from the study as they were included in a concurrently running ROP study. Twenty-eight of the remaining 84 babies examined were found to have ocular problems. These included retinal haemorrhages which were found in 64 percent of the 28 babies, deeply yellow retinae in 18 percent and retinal oedema in seven percent. Although all the changes encountered resolved by the time the babies were discharged, it is recommended that the eyes of babies admitted into the special care baby unit for whatever reason, should be routinely examined, in order to identify early changes that are amenable to treatment.

Introduction

OCULAR abnormalities in newborn infants needing special care, have to our knowledge, not been documented in our environment. Apart from numerous studies on retinopathy of prematurity (ROP),[1-4] a literature search has revealed little information about studies on the eyes of newborn babies in Europe and America as most newborn babies are discharged home within 48 hours of birth. While planning a study on ROP in the only special care baby unit in Oyo State, we decided to carry out in addition, ophthalmic examination of the eyes of other babies who were admitted to the unit but were not eligible to be included in the ROP study. The study was designed to determine the pattern and severity of ocular abnormalities in newborn babies requiring special care and to find out the outcome of such problems.

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Patients and Methods

Over a six-month period (January - June 1995), all babies except those at risk of developing ROP, who were admitted into the special care baby unit (SCBU) of the University College Hospital (UCH), Ibadan, were recruited into the study. Admissions into the Unit included those born in the UCH and others referred to the Unit from other health institutions. The babies excluded from the study, were those considered to be at risk of developing ROP, and were therefore, subjects of a separate study on ROP; they were less than 31 weeks gestation or weighed less than 1,500g at birth.[3]

A protocol which was designed for the study sought to obtain the gestational age, birthweight, sex, reason for admission to the Unit, and findings on full ophthalmological examination. The ophthalmic examination was performed between 24 and 72 hours of birth and repeated just before the baby was discharged from the Unit. Both pupils were dilated with *gutt* cyclopentolate 0.5 percent and *gutt* phenylephrine 0.25 percent, 30 and 60 minutes, prior to the examination which was performed by a single ophthalmologist using a pen-torch for external examination and a binocular indirect ophthalmoscope with a 20 diopter hand lens for retinal

examination. The eyelids were held open with a neonatal eye speculum.

Results

Within the six-month study period, 84 babies (53 males and 31 females) with birthweights ranging from 1520g to 4500g and gestational ages of 32-43 weeks who were eligible for inclusion, were examined. Twenty one (25 percent) of the 84 babies were born at 32-35 weeks gestation while eight (9.5 percent) were over 40 weeks gestation.

Indications for admission into the SCBU are listed in Table I.

Table I

Indications for Admission to the Special Care Baby Unit

Indications	*Number of Babies*	*Percent of Total*
Birth asphyxia	34	27.6
Prematurity	21	17.0
Suspected sepsis	14	11.4
Emergency caesarean section*	13	10.6
Prolonged/obstructed labour	11	8.9
Neonatal jaundice	6	4.9
Septicaemia	5	4.1
Aspiration pneumonia	4	3.3
Hypoxic-ischaemic encephalopathy	3	2.4
Others+	12	9.8
Total	123	100.0

*For obstructed labour and foetal distress (7 cases), maternal eclampsia (4 cases), maternal rheumatic fever (2 cases).

+: Two cases each of hypoglycaemia, respiratory distress and intrauterine growth retardation, and one case each of neonatal meningitis, anaemia, seizures, severe vomiting, intestinal obstruction and maternal antepartum haemorrhage.

The most common indications were moderate to severe birth asphyxia (34 cases), prematurity (21 cases), suspected and confirmed sepsis (19 cases), and prolonged/obstructed labour with foetal distress (18 cases); some of the babies had more than one problem.

Twenty-eight (33.3 percent) of the 84 babies had ocular abnormalities which are listed in Table II.

Table II

Ocular Abnormalities in 28 Babies Admitted to the SCBU

Abnormalities	*Number of Babies*	*Percent of Total*
Retinal haemorrhage in both eyes	17	60.7
Mild (4)		
Moderate (9)		
Severe (4)		
Deeply yellow retinae	5	17.8
Bilateral retinal oedema	2	7.1
Solitary macular haemorrhage	1	3.6
Subconjunctival haemorrhage	1	3.6
Large choroidal haemorrhage	1	3.6
Retinopathy of prematurity	1	3.6
Total	28	100.0

SCBU = Special Care Baby Unit

The commonest abnormality was retinal haemorrhage which occurred in 17 (60.7 percent) of the 28 babies. One of these babies had a solitary macular haemorrhage. Further analysis showed that 13 of the 84 babies examined were delivered by caesarean section. Of the 13, five (38 percent) had retinal haemorrhages. Only one baby was found to have retinopathy of prematurity which was stage I, zone III, in both eyes; the baby was of a gestational age of 36 weeks and birthweight 1600g, who had septicaemia and received oxygen therapy. The commonest condition associated with ocular abnormalities was prolonged/obstructed labour, in which eight (61.5 percent) of 13 babies had abnormal ocular findings. Three (75 percent) of four babies born to eclamptic mothers by emergency caesarean sections also had ocular abnormalities consisting of retinal haemorrhages in two and retinal oedema in one. Out of the 34 babies admitted for moderate to severe birth asphyxia, four (11.8 percent) had ocular changes. No congenital ocular abnormalities were found in any of the babies examined.

By the time the 28 babies were discharged from the SCBU, all the ocular abnormalities had completely resolved; these included the one case of ROP which had regressed with good vascularisation of the peripheral retina.

Discussion

The incidence of retinal haemorrhage is estimated to vary between 20 and 50 percent of all neonates after vaginal delivery.[5-7] These haemorrhages are venous in origin and usually resolve within 10 days after delivery. The mechanism of injury appears to be the squeezing of the thorax, with consequent changes in intracerebral venous pressure during delivery.[5 8] Chest compression from any cause raises intrathoracic pressure which can directly cause increased retinal venous pressure and subsequent retinal haemorrhage. This occurs by two mechanisms namely, elevated jugular venous pressure and elevated intracranial pressure.[7] A similar spectrum of injuries may be seen after traumatic delivery in neonates,[9] and after prolonged Valsalva's manoeuvres such as occur during childbirth.[10] In the present study, 64 percent of the babies with ocular abnormalities had retinal-haemorrhages. This rate is higher than rates reported from other studies [5 6 8] in which the rates have varied between 20 and 50 percent. The reason for this difference could be related to differences in the study populations. For instance, the group of babies studied in the present series had problematic deliveries; some had severe birth asphyxia which required resuscitation and some were born after prolonged or obstructed labour. By contrast, the reported rate of 20 percent was found in a study involving 46 babies who were delivered normally *per vaginam*.[5]

Eleven babies in the present series were born by emergency caesarean section, for reasons which included eclampsia, prolonged obstructed labour and foetal distress; out of the 11, 38 percent had retinal haemorrhage. By contrast, in a study reported by Sezen,[7] only 0.8 percent of babies delivered by caesarean section had such haemorrhages. The difference between the two rates could be due to the fact that in our cases, all the 11 babies who were eventually delivered by caesarean section had earlier undergone attempted vaginal delivery which is known to be associated with a higher rate of foetal retinal haemorrhages than caesarean section. The explanation proffered for the lower incidence with caesarean section is that the rise in intrathoracic pressure and accompanying rise in retinal venous pressure, which occur during vaginal delivery as the thoracic cage passes through the birth canal, do not occur during caesarean delivery.

Other ocular abnormalities like subconjunctival and choroidal haemorrhages can also be explained by the increase in intrathoracic pressure with subsequent increased jugular venous pressure and back pressure effect into the conjunctival and choroidal vasculature. Similarly, a much less severe pressure might explain the generalised retinal oedema which was found in two babies who did not have associated retinal haemorrhage. The deeply yellow retinae which were seen in five of the six babies who had neonatal jaundice, was probably due to extravasation of bilirubin whose levels were high enough to necessitate exchange blood transfusion, from the blood, into the retinal layers.

The finding of retinopathy of prematurity in a baby who had septicaemia and received oxygen therapy, but was delivered at 36 weeks gestation and weighed over 1500g at birth, though not common, is not unusual. It has been documented in previous studies, that ROP occasionally occurs in babies who, being older than 31 weeks gestation and weighing more than 1500g at birth, are at low risk of developing ROP.[4 11]

Although all the ocular abnormalities observed in the present study resolved, it is advisable that the eyes of all babies admitted into special care baby units for whatever reasons, be routinely examined, so that treatable abnormalities such as retinopathy of prematurity could be identified early, monitored, and if necessary, treated.

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