

Clinical study of birth injuries in the new born at a tertiary care hospital

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Abstract

The majority of pregnancies result in the birth of a mature vigorous infant showing little evidence of any untoward effects from the stress of labour and delivery. Nevertheless about 5-10% of births are accompanied by signs suggestive of fetal distress during labour and even a higher percentage by depression of the newborn infant, indicating that this phase of intra uterine life is not without potential danger. The study consists of 100 cases of birth trauma noticed among 850 consecutives viable birth during the study period of 1½ years. Proforma contains the details of the health status of the mother, antenatal, intranatal and postnatal particulars including the age, sex, weight, mode of delivery, type of presentation and nature of the birth injury in different modes of delivery and type of presentations of the baby. 29% of babies delivered during the study period had signs of asphyxia. Apgar scoring was the basis for asphyxia. Cephalohematoma was noted in 32 cases (3.76%), 4 (0.47%) of the babies had neurological injuries. Among facial nerve palsy 4 (0.47%), subaponeurotic hemorrhage was noted in only one baby. No fractures were noted among the babies.

Keywords: Birth injuries, stress of labour, delivery

Introduction

The term birth injury is used to denote avoidable and unavoidable mechanical or anoxic trauma incurred by the infant at birth ^[1]. Is also defined by the National Vital Statistics Report as “An impairment of the infants body or structure due to adverse influences, which occurred at birth”. Injury may occur, antenatally, intrapartum or during resuscitation and may be avoidable or unavoidable ^[2]. Most often the word Birth injury is misinterpreted as avoidable trauma incurred through the lack of medical skill or attention. In order to prevent latter misunderstandings, incriminations and self-recriminations on the part of the parents of a child, who has residuals from birth trauma, Anoxia or disease, it is important that the paediatrician spends some time to inform the parents about the broad use of the term birth injury and the fact that the trauma or anoxia may be unavoidable during the process of birth. The majority of pregnancies result in the birth of a mature vigorous infant showing little evidence of any untoward effects from the stress of labour and delivery. Nevertheless about 5-10% of births are accompanied by signs suggestive of fetal distress during labour and even a higher percentage by depression of the newborn infant, indicating that this phase of intra uterine life is not without potential danger. Difficult mechanical obstruction during delivery

are encountered frequently in modern obstetric practice. A low perinatal mortality rate is frequently cited as evidence for the excellence of antenatal care and management of labour but life or death of the infant is a crude and uninformative criterion of standard of care [3].

Morbidity is a more informative criteria of greater significance in the relation between birth asphyxia or other stress and the permanent damage to the C.N.S.

Uterine contractions result in pressure changes in the amniotic cavity, pressure ranges from 8 to 12 mm of mercury during period of relaxation, and from 20 to 60 mm at the height of uterine contraction which recur every 3 to 4 minutes during the active phase of labour and result in certain alternations in the maternal and fetal hemodynamics and fetal acid base status [4].

Vaginal delivery is accompanied by considerable pressure changes on the fetal head resulting in moulding of the cranial bones and the formation of caput succedaneum. Little is known about the effects of this temporary (laceration) change in the shape of the cranium on its contents in the newborn infant. In breech delivery unforeseen mechanical difficulties can delay or subject the fetal head to sudden pressure changes with the risk of intra cranial vascular accident [5].

Fluid present in the pharynx and upper respiratory passage is squeezed out through the mouth and nose during delivery while the chest it still subject to pressure changes from the vaginal walls and pelvic muscles. The squeezing effect on the thorax allows fluid and mucus to be expelled from the upper respiratory tract immediately prior to delivery and is probably an advantage to the newly born infant [6].

Methodology

Mothers who are having dystocia and complicated pregnancies are referred from other hospitals in the later stages of delivery. Annually about 600 mothers give birth to the babies in this hospital, managed by the qualified obstetricians and paediatricians.

The study consists of 100 cases of birth trauma noticed among 850 consecutives viable birth during the study period of 1½ years. Proforma contains the details of the health status of the mother, antenatal, intranatal and postnatal particulars including the age, sex, weight, mode of delivery, type of presentation and nature of the birth injury in different modes of delivery and type of presentations of the baby.

Each newborn baby was examined thoroughly according to proforma and also previous obstetric history, details of delivery, antenatal checkup etc., were obtained.

The following investigations were done as and when needed:

1. Radiological studies for evidence of fractures.
2. In asphyxiated babies serum calcium and blood glucose estimation were done.
3. C.S.F. was subjected to microscopic exam, protein and sugar estimation.

Results

Table 1: Types of deliveries noted in 850 babies

Types of deliveries	Number	Percentage
Normal vaginal	765	90
Forceps	15	1.76
Caesarean	60	7.05
Breech	10	1.17
Total	850	100

Normal vaginal deliveries constituted 90% of the total deliveries. 7.05% were caesarean, 1.76% were forceps and breech in 1.17%.

Table 2: Shows the spectrum of birth injuries in 850 deliveries

	Type of birth injury	No. of cases
1.	Asphyxia	45
2.	Cephalohematoma	32
3.	Soft tissue injuries	18
4.	Neurological injuries	4
	a. Facial nerve palsy	4
5.	Subaponeurotic hemorrhage	1

5.29% of babies delivered during the study period had signs of asphyxia. Apgar scoring was the basis for asphyxia. Cephalohematoma was noted in 32 cases (3.76%), 4 (0.47%) of the babies had neurological injuries. Among facial nerve palsy 4 (0.47%), subaponeurotic hemorrhage was noted in only one baby. No fractures were noted among the babies.

Table 3: Weight of the baby

Weight in grams	Number of cases
1000-2000	18
2001-3000	66
3001 and above	26

Birth injuries were less common in babies who were weighing less than 2000 (18%) gms and highest among the children of 2001-3000 gms (66%).

Table 4: Antenatal history

Registered	45
Unregistered	55

Birth injuries, were noted more commonly in babies born to the mothers who were not attending the antenatal clinic regularly as compared to mothers who were attending the clinic regularly of this 45% of registered 15% had preeclamptic toxemia.

Table 5: Showing the cases of birth asphyxia in relation to nature of delivery

Nature of delivery	Number of cases
Vertex	30
Forceps	07
L.S.C.S.	08
Total	45

Maximum incidence of birth asphyxia was recorded in vertex deliveries.

Table 6: Clinical features in asphyxia

1.	Apgar score	
	a. Less than 3	10
	b. 4 to 5	23
	c. 6 to 7	10
2.	Generalized convulsions	18
3.	Minor seizures	11
4.	Cyanotic spells	43
5.	Respiratory grunt	15
6.	Chest retraction	08
7.	Feeble cry	38
8.	Sluggish reflexes	35

10 babies had apgar score less than 3.33 babies had apgar score less than 7.18 babies developed generalized convulsions within 72 hours after the birth, among them six children expired, and twelve babies made uneventful recovery. 11 babies had minor seizures characterized by uprolling of eye balls, stiffness of the limbs and unilateral convulsions. Cyanosis was noted in all the children. 38 children had feeble cry and 15 children had respiratory grunt respectively. New born reflexes were sluggish in 35 babies.

Table 7: Laboratory investigations in asphyxiated babies

Investigations	Value
Mean blood sugar	43.28 ± 21.89%
Mean serum cal. level	7.81 ± 1.58%
C.S.F. protein content (mean)	48 ± 12.18%
C.S.F. sugar	28 ± 3.12%
Cells (RBCS) mean	210 ± 6%

All children who were having asphyxia were investigated to know the blood sugar, serum calcium and protein content of CSF and cellular content of CSF. In this study it was found that blood glucose and calcium were found to be within the normal limits. Mean value for protein content in CSF was high and cells mostly RBCS were found to be increased in number.

Discussion

The term birth injury denotes that an avoidable or unavoidable mechanical injury or hypoxic injury during the process of delivery. Even though there has been declining incidence of injuries in the recent years due to improvement in the quality of obstetrical care still, this remains a major cause of morbidity and mortality in neonatal period and forms one of the most important preventable cause of neonatal morbidity and to certain extent mortality even in major institutions [7].

In the present study the incidence of birth injury among the total live births was 28/1000 or 117.6%. The incidence varies from place to place and also in different parts of the world, mostly determined by the quality of obstetrical care available. In the developed countries the incidence is tending to decline due to the advancement in the field of perinatology. It remains to be high in the developing countries. Most of the studies are hospital based on community studies are not available.

Asphyxial injuries were the commonest followed by cephalohematoma, peripheral nerve injuries were recorded, no fractures were noted among the total number of injuries. Magee Womens Hospital Pittsburgh reports that, of the 38,045 deliveries between 1970 and 1975, 445 children had asphyxia with an incidence of 1.16%.

Drage *et al.* reports an incidence of 5.3%, Meharban Singh and Veen Kaltna from A.I.I.M.S. Delhi, reports sand incidence of asphyxia in 3.1%. In this study of 4350 infants born during 1974 and 1976, 135 babies had asphyxia when compared with other studies, incidence is low in the present studies of 1.23%. This reflects in the quality and care available in this hospital, or due to better understanding of recent development in antenatal care since the incidence was noted some years back [8].

The birth weight of the baby is of great importance. The small baby whether he is S.F.O. or preterm is likely to have been born after the complications of pregnancies and is more susceptible to hypoxic injuries or traumatic insults during the delivery and labour and to sustain brain damage in the immediate neonatal period. At the same time it must be remembered that babies that are large are particularly prone to suffer from traumatic damage

during labour.

18% of the babies were weighing less than 2 kgs and 16% of the babies were weighing more than 3 kgs.

Health status of the mother determines the outcome of the pregnancy. Toxaemia of pregnancy may lead to anoxia, resulting as an after effect of prolonged convulsion. This may also result by maternal medication. The mothers who are attending the antenatal clinic regularly tend to have less complicated delivery because of the early recognition of the complications and early intervention. 55% of the mothers were not attending the antenatal clinic and 45% attending regularly of which 15% of the mothers had eclampsia ^[9].

74% of the babies who had asphyxia were delivered by vertex presentation. 16.6% were delivered by caesarian section. During normal labour remarkably low oxygen pressure levels have been recorded but abnormalities of labour may produce much more severe hypoxia. Hypoxia is liable to occur if there is prolonged uterine contractions, impairing the placental circulation as occurs in obstructed labour. LSCS is usually resorted to if there is fetal distress or prolonged labour of any cause. Hence more chances of hypoxia in the new born. If elective LSCS is resorted there will be practically no occurrence of hypoxia.

Hypoxia may affect the foetus in the womb or during the course of delivery. There will be dilatation, stasis of blood supplying cranial blood vessels, secondary to rise in PCO₂ in the blood. The child may develop cerebral oedema because of sluggish cranial blood circulation or petechial haemorrhage or massive hemorrhage depending upon the duration and degree of hypoxia. Immediately after the birth the new born may develop hypoxia secondary to pulmonary complications or CNS complications ^[10].

Conclusion

Asphyxia injuries form the major group which were noted in 45 of the total 100 injured babies. 30 babies who had asphyxia were born with vertex presentation. only 8 babies who had asphyxia were delivered by caesarean section and 7 babies by forceps application. Apgar score was less than 3 in 10 cases. In 33 cases at was less than 7. 18 babies had convulsions, 43 babies had cyanotic attacks and 38 babies had feeble cry. Mean blood glucose level was 43.28 + 21.89/dl Ca. level was 7.81 + 1.58 ml. gm/dl. The C.S.F. analysis showed no significant changes in these cases.

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