

OUTCOME OF NEWBORNS WITH BIRTH ASPHYXIA

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ABSTRACT

Birth asphyxia is one of the common causes of mortality and morbidity in neonates and the incidence is 2–9 per 1000 live births. The present work is a retrospective hospital based observational study. Babies born at B.P. Koirala Institute of Health Sciences, Dharan, Nepal during the period from April 2002 to April 2003 with gestational age ≥ 37 weeks with Apgar score ≤ 6 at 5 minutes were included in the study. The aim was to study the clinical profile, the acid base parameters and the outcome of asphyxiated newborns. Babies with congenital defects, evidence of infection and maternal drug addiction were excluded from the study. All babies were resuscitated according to the guidelines of American Heart Association. Data on 50 birth asphyxia cases were tabulated and analysed. There were 10 (20%) cases of severe birth asphyxia (Apgar score: 1-3) and 40 (80%) cases of moderate birth asphyxia (Apgar score: 4-6). Staging of hypoxic ischaemic encephalopathy (HIE) was performed according to Sarnat's staging. Thirty percent of these cases presented with various stages of HIE and the incidence was higher in low Apgar score group. The common presentations of HIE cases had depressed neonatal reflexes, seizures, lethargy, and pupillary abnormalities. The common acid base disturbance was metabolic acidosis which was observed only in babies with HIE-3. Two neonates (4%) died during the hospital stay due to multiorgan failure and severe metabolic acidosis.

Key Words: Birth asphyxia, Hypoxic ischaemic encephalopathy, Apgar score.

INTRODUCTION

B. P. Koirala Institute of Health Sciences, Dharan (BPKIHS) is situated in eastern part of Nepal having modern monitoring and mechanical ventilation facilities. Birth asphyxia is one of the common cause of mortality and morbidity in neonate and the incidence is 2-9 per 1000 live births.¹ Perinatal asphyxia is an important cause of mortality and of subsequent neurologic disabilities among the infants who survive.² Newborn infants who sustain an acute intrapartum hypoxic ischaemic insult (HIE)

of sufficient magnitude to result in longterm neurological sequelae invariably have recognizable clinical encephalopathy during the first days of life.³ These infants have evidence of derangements in many organs. Their cerebral function is depressed and remains depressed for days or weeks and they frequently have seizures soon after birth.⁴ Among the complications of birth asphyxia, HIE and multiorgan failure are the most dreaded complications.⁵ The present study was to observe the clinical profile, acid base disturbance and outcome of neonates with birth asphyxia.

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MATERIALS AND METHODS

It is a retrospective, observational, hospital based study. Babies born at BPKIHS from April 2002 to March 2003 with gestational age 37 weeks having Apgar score ≤ 6 at 5 minutes were included in this study. Babies with congenital defects, evidence of infection or maternal history of drug addiction were excluded. The birth asphyxia was classified as moderate (Apgar score 4-6) and severe (Apgar score 1-3) according to the 5 minutes Apgar score. The study included 50 newborns with different stages of birth asphyxia. Severe birth asphyxia was found in 20% and moderate birth asphyxia in 80% cases. Blood gas analysis could be performed in 12 cases. All asphyxiated newborns required bag and mask ventilation. Endotracheal intubation was required in 8%, drugs were used in 4% while 8% of cases were mechanically ventilated.

RESULTS

Among 50 cases studied, severe birth asphyxia was noted in 20% and moderate birth asphyxia in 80% of cases. There were 46 (92%) term and 4 (8%) post term babies. Three (6%) babies developed HIE-1, 8 (16%) developed HIE-2 and 4 (8%) developed HIE-3. Acid base parameters were studied in 12 cases out of which 4 were of severe birth asphyxia while 8 were of moderate asphyxia. The mean blood pH were 6.975 and 7.2 for severe and moderate birth asphyxia group respectively. Similarly, the bicarbonate levels were 7.25 and 14.25 mmol/L. Severe metabolic acidosis was found only in HIE – 3 neonates. Two babies who died had blood pH of 6.8 and 6.9, respectively while the corresponding bicarbonate levels were 5 and 7 mmol/L, suggesting severe metabolic acidosis. The common clinical

Table I: Clinical presentation of the cases of HIE (N= 15)

Hyperalertness	3	20%
Lethargic	12	80%
Seizure	12	80%
Excessive bronchial secretion	4	26.6%
Depressed sucking reflex	15	100%
Exaggerated moro reflex	3	20%
Depressed moro reflex	12	80%
Dilated pupil	7	46%
Constricted pupil	8	54%

presentations of babies with HIE are depicted in Table I. All babies had abnormal neonatal reflexes in the form of depressed sucking reflex (100%) and either depressed (80%) or exaggerated (20%) Moro's reflex. All the babies had pupillary abnormality which was either dilated (46%) or constricted (54%). Others features included lethargy (80%), seizures (80%), hyperalertness (20%) and excessive bronchial secretion (26.6%). The correlation of 5 minutes Apgar score with the incidence of HIE are given in Table II. The incidence of HIE

Table II: Correlation of 5 minutes apgar score and incidence of HIE (N=15)

Apgar score at 5 minutes	Number of cases	Number of HIE (%)
2	4	4 (100%)
3	6	5 (83%)
4	5	3 (60%)
5	20	2 (10%)
6	15	1 (6.6%)

was 100% in the Apgar score 2 group. The respective incidences were 83%, 60%, 10% and 6.6% for Apgar score 3, 4, 5 and 6 respectively. The incidence of HIE was 90% in severe birth asphyxia neonates while it was only 15% in moderate birth asphyxia cases.

DISCUSSION

The present study was conducted on 50 full term neonates with birth asphyxia (Apgar score ≤ 6 at 5 minutes). Moderate birth asphyxia (Apgar score 4–6) constituted 80% of cases while rest 20% were of severe birth asphyxia (Apgar score ≤ 3). These results are similar to the observations of other workers.⁶ Thirty percent of these babies developed HIE. The incidence of HIE was 90% in severe birth asphyxia neonates while it was 15 percent in moderate birth asphyxia group. The changes in the acid-base parameters were more pronounced in the severe birth asphyxia patients and most of them presented with severe metabolic acidosis. Other workers^{7,8} also reported that acid base changes were directly related to the degree of birth asphyxia. Though the 1 and 5 minutes Apgar score are poor predictors of neonatal acidosis, an Apgar score of ≤ 3 increases the risk of low cord pH 4.8 times.⁹ Other authors^{10,11} also reported poor outcome in neonates having low Apgar scores at birth.

Thornberg et al.¹² in a study on Swedish population, reported that all infants with severe HIE either died or developed neurological damage. The mortality of severe birth asphyxia neonates was 20% while there was no mortality in moderate birth asphyxia group.

CONCLUSION

The present study concludes that 5 minutes Apgar score could be a good predictor for HIE. The most common acid base abnormality is metabolic acidosis, which is more severe when the Apgar score is low. The incidence of HIE was 90% for severe birth asphyxia group and it was only 15% in moderate asphyxia neonates. The mortality rate was 20% for severe birth asphyxia while none died in the moderate asphyxia group.

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