

## **Changing Profile of Birth Asphyxia**

**A.V. Mane  
S.R. Daga**

Birth asphyxia is an important cause of mortality and morbidity in newborns. Prompt and effective resuscitation can considerably reduce the deaths and disability due to asphyxia. In this study we have compared the clinical profile of birth asphyxia following availability of good quality bag and mask, a warm room for resuscitation, training of staff nurses in resuscitation and constant presence of a neonatal resident close to the labor room.

### **Subjects and Methods**

All the babies born during 1984 and

1989 with Apgar score 7 and less at 1 minute were studied retrospectively from the case records. Relevant information was collected in a computer-compatible proforma covering general information, diseases complicating pregnancy, obstetric problems, intra-partum events, clinical profile of the newborn including details of resuscitation, involvement of various systems and progress during hospital stay. The data was entered in the IBM/PC-XT computer in d-base language. Significance testing (chi square test) was done using SPSS software.

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*From the Institute of Child Health, Grant Medical College and J.J. Hospital, Bombay.*

*Reprint requests: Dr. S.R. Daga, 1/11 Staff Quarters, J.J. Hospital, Bombay 400 008.*

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## Results

There were 2579 deliveries and 39 cases of asphyxia in 1984 as against 1947 births and 71 cases of asphyxia in 1989. Sex, birth weight and gestational age distribution was comparable for 1984 and 1989. Antenatal factors like pregnancy induced hypertension, diabetes mellitus, cardiac disease, urinary tract infections, multiple pregnancy and intrapartum hemorrhage, prolonged rupture of membranes, cephalopelvic disproportion and presentation showed no significant differences. Obstetric interventions including use of oxytocin, vacuum or forceps application and cesarean section were also comparable.

Frequency of abnormal fetal heart rate was comparable but that of meconium passage *in utero* was significantly higher in 1989. The frequency of Apgar score distributions at 1 minute was comparable. However, that of low scores at 5 minutes declined significantly. The frequency of intubation, cardiac massage and use of drugs was significantly less in 1989. Use of bag and mask ventilation was comparable (Table I).

The occurrence of convulsions and hypoxic-ischemic encephalopathy significantly declined in 1989. Cardiovascular system involvement in form of shock, persistent fetal circulation, congestive cardiac failure and transient tachypnea of newborn, respiratory system involvement in form of hyaline membrane disease and meconium aspiration syndrome also showed a significant decrease (Table I)

Establishment of spontaneous breathing in less than 30 minutes, recovery of tone in less than 2 hr, and need for tube feeding for less than 7 days were significantly higher in 1989. However, the duration of hospital stay remained unchanged.

**TABLE I**—Clinical Features of Patients with Birth Asphyxia

Variable	1984 (n=39)	1989 (n=71)
Apgar score (5 min)		
Less than 7	30	34*
Resuscitation required		
Intubation	19	5****
Bag and mask	30	61
Cardiac massage	19	5****
Drugs	39	19****
Cardiovascular involvement	14	11**
Respiratory involvement	15	11**
Convulsions	13	2****
Hypoxic-ischemic encephalopathy	18	2****
Recovery parameters		
Spontaneous breathing less than 30 min	27	65**
Tone recovery less than 2h	22	64****
Tube feeding 7 days and less	34	50*
Outcome		
Discharged	23	60**
Hospital stay (mean)	8.4 days	8.8 days

\* p<0.001; \*\*p<0.05; \*\*\* p<0.005; \*\*\*\* p<0.0005.

## Discussion

Reduction in the occurrence of birth asphyxia is generally attributed to better monitoring of the fetus; electronic, and biochemical (1). Natal events have been associated with cerebral palsy and associated handicaps(2). Suitable interventions, to decrease occurrence of asphyxia, usually means an increase in operative deliveries(3). At our institute,

either in 1984 or in 1989, electronic or biochemical monitoring was not used. Fetal heart rate record by intermittent auscultation and meconium passage *in utero* were the only available ways for diagnosis of intrapartum asphyxia. There was also no significant change in the Caesarian section rate.

Restoration of Apgar score to normal by 5 minutes indicates prompt and effective resuscitation. It also means that resuscitation equipment is good and resuscitation team is competent. In this study, bag and mask resuscitation was all that was required in the majority of cases. The use of endotracheal intubation declined significantly in 1989. Majority of the neonatology textbooks are liberal in advocating intubation and intermittent positive pressure ventilation(1,3). Intubation delays resuscitation not only because it takes time to intubate but also because many infants are not correctly intubated (4). This requires training and experience, things that cannot be taken for granted in developing countries. In the Swedish National Programme for Resuscitation, bag and mask ventilation was found effective in 96% asphyxiated babies(5). A simpler interventions using bag and mask has a place in our situation(6). Provision of adequate warmth during resuscitation using appropriate technology is also important(7).

Low Apgar scores especially at 5 minutes, hypoxic-ischemic encephalopathy and convulsions are the spectrum of the same disease. Therefore, restoration of Apgar score to normal by 5 minutes in majority of cases has reflected in a significant decline in convulsions and

encephalopathy in 1989. Birth asphyxia is a multisystem disease. Prompt and effective resuscitation in 1989 has also significantly reduced the involvement of cardiovascular system in form of shock and congestive cardiac failure, respiratory system in form of meconium aspiration syndrome or hyaline membrane disease, gastrointestinal involvement like necrotising enterocolitis or gastric ulcers, and disseminated intravascular coagulation. Survivals also increased significantly in 1989 compared to 1984.

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