ASSESSMENT OF BURDEN OF ASPHYXIATED BABIES ACCORDING TO METHOD OF RESUSCITATION AT TERTIARY CARE HOSPITAL

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Article Info: Received 25 August 2019; Accepted 12 September 2019
DOI: https://doi.org/10.32553/ijmbs.v3i10.627
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Conflict of interest: No conflict of interest.

Abstract

Background: Perinatal asphyxia is characterized among the fetus or new born due to deficiency of perfusion to the various organs of the fetus or new born. Birth asphyxia is the single most important perinatal cause of brain damage in term infants. When asphyxia is followed by an abnormal neonatal behavior a syndrome has been described known as hypoxic ischemic encephalopathy.

Material & Methods: The newborn with congenital malformation of CNS were excluded from the study. Each selected newborn was subjected to Apgar scoring at birth and assessment of gestational age. The Apgar scoring was done at one and five minutes after births and infants were categorized into mild, moderate and severe birth asphyxia according to Apgar score at 1 minute of age after birth.

Results: In the present study, on the basis of clinical symptoms we found that asphyxiated group males comprised 62% cases and females 38% cases male female ratio was 1.63:1.0 it is statistically insignificant as compared to control group where male female ratio was 2.59:1. In Mild and moderate asphyxia male preponderance was seen while in severe asphyxia the difference was not marked There was no statistically significant sex difference in birth asphyxia.

Conclusion: We concluded from the present study that in resuscitation of mild and moderately asphyxiated babies Bag and Mask was used more frequently (40% and 82.5% respectively) and endotracheal tube with Ambubag was used more (75%) frequently for severely asphyxiated babies.

Key words: asphyxia, resuscitation, Ambubag.

Introduction:

Perinatal asphyxia is characterized among the fetus or new born due to deficiency of perfusion to the various organs of the fetus or new born (1). Birth asphyxia is the single most important perinatal cause of brain damage in term infants (2). When asphyxia is followed by an abnormal neonatal behavior a syndrome has been described known as hypoxic ischemic encephalopathy (3). The ischemic insult may result from impaired placental gas exchange or blood flow, from umbilical cord compression or may occur postnataly due to neonatal respiratory or cardiac compromise. Post-natal insult usually account for only 10% of infant evidence of hypoxic ischemic encephalopathy (4).

A variety of biochemical disturbances accompanies with birth asphyxia and they can contribute to the neurological syndrome and brain damage of asphyxiated new born Hypoglycemia is a common metabolic alteration in birth asphyxia (5). In birth asphyxia the hypoglycemia is due to glycogen depletion, secondary to catecholamine release and to an unexplained hyper insulimnic state (6) and a defect in fatty acid mobilization and lipid metabolism (7).

Hypocalcaemia is a common metabolic alteration in neonatal asphyxia syndrome (8). The exact of mechanism of hypocalcaemia in birth asphyxia is not known. The most important application of this technique lies in elucidating the mechanism and evolution of preventive measures against perinatal brain damage.

There is little information of new born brain ultrasound in Indian literature; however incidence of asphyxia is perhaps similar to that reported in western literature. We conduct present study to assess the burden of Asphyxiated Babies According to Method of Resuscitation at tertiary care hospital.
MATERIALS & METHODS

The present prospective study was conducted at department of pediatrics of our tertiary care hospital. The study was an observational study conducted during a period of one year. A sample size of 150 was calculated at 95% confidence interval at 10% of maximum allowable error. Patients were enrolled by simple random sampling. Clearance from hospital ethics committee was taken before start of study. Written informed consent was taken from each study participant.

Mother of each selected baby was subjected to detailed antenatal history. The babies were subjected to general physical, systemic examination and their neurological status was assessed at 48 to 72 hours after birth. The selected babies were subjected to detailed ultrasonographic examination of the brain. The cranial Ultrasound was done on day -3, day -7 and at the end of second week of life and on follow up at between 4 -12 weeks of life. The newborn with congenital malformation of CNS were excluded from the study. Each selected newborn was subjected to Apgar scoring at birth and assessment of gestational age. The Apgar scoring was done at one and five minutes after births and infants were categorized into mild, moderate and severe birth asphyxia according to Apgar score at 1 minute of age after birth. Serum calcium estimation was done by Clark and Collip method, in first 24 of life in 70 asphyxiated babies and Blood Sugar estimation was done by Nelson Somogy's method. Data analysis was carried out using SPSS v22. All tests were done at alpha (level significance) of 5%; means a significant association present if p value was less than 0.05.

RESULTS

In the present study, we included 100 of the above full-term asphyxiated babies and 50 normal term newborns for control. In first 24 hours of life in same 70 asphyxiated babies. In asphyxiated group 27% cases come from peripheral centres and 73% delivered in Zanana hospital. In control group 88% of babies were delivered in hospital and 12% come peripheral centres. (Table 1)

Table 1: Distribution of Babies According to Place of Birth

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Place of Birth</th>
<th>Control n50</th>
<th>Mild n25</th>
<th>Moderate n35</th>
<th>Severe n40</th>
<th>Total 11=100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
<td>No.</td>
</tr>
<tr>
<td>1</td>
<td>Mahila and Zenana Hospital</td>
<td>44</td>
<td>88</td>
<td>18</td>
<td>72</td>
<td>25</td>
</tr>
<tr>
<td>2</td>
<td>Peripheral Centres</td>
<td>6</td>
<td>12</td>
<td>7</td>
<td>28</td>
<td>10</td>
</tr>
</tbody>
</table>

In the present study, on the basis of clinical symptoms we found that asphyxiated group males comprised 62% cases and females 38% cases male female ratio was 1.63:1.0 it is statistically insignificant as compared to control group where male female ratio was 2.59:1. In Mild and moderate asphyxia male preponderance was seen while in severe asphyxia the difference was not marked. There was no statistically significant sex difference in birth asphyxia. (Table 2)

Table 2: Distribution of Asphyxiated Babies According to Sex & Grades of Birth Asphyxia

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Sex</th>
<th>Asphyxiated</th>
<th>Mild (n=25)</th>
<th>Moderate (n=35)</th>
<th>Severe (n=40)</th>
<th>Total (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td></td>
<td>18</td>
<td>72</td>
<td>22</td>
<td>62.86</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td></td>
<td>7</td>
<td>28</td>
<td>13</td>
<td>37.14</td>
</tr>
</tbody>
</table>

In the present study, endotracheal intubation was required, in 36% of cases to revive they while and mask was used in 49% cases. In severely asphyxiated babies the ETT was used in 75% babies while bag mask was used in 25% cases only. In mildly asphyxiated group 60% babies were resuscitated by suction of throat, nasopharynx and physical stimulation and 40% needed bag and mask ventilation moderately asphyxiated group bag and mask was used more frequently than ETT, 82.8% and 17.14% respectively. Thus, in severely asphyxiated babies the ETT was used more frequently as compared to mild and moderately asphyxiated babies.
Table 3: Distribution of Asphyxiated, Babies According to Method of Resuscitation

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Mode of Resuscitation</th>
<th>Mild (n=25)</th>
<th>Moderate (n=35)</th>
<th>Severe (n=40)</th>
<th>Total (n=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td>Bag &amp; Mask</td>
<td>10</td>
<td>40</td>
<td>29</td>
<td>82.8</td>
</tr>
<tr>
<td></td>
<td>ETT</td>
<td>0</td>
<td>6</td>
<td>17.14</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Suction of throat, Nasopharynx &amp; Physical Stimulation</td>
<td>15</td>
<td>60</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

DISCUSSION

The present study was conducted on 100 full term newborn infants who suffered perinatal asphyxia. 50 term normal newborn were taken as control cases. Babies with gross congenital anomalies of CNS were excluded from the study. Each newborn was subjected to APGAR scoring at birth and assessment of gestational age, general physical and systemic examination and necessary investigations in the postnatal period.

In the present study 73% of babies were born in Zanana hospital and Mahila Chikitsalaya of SMS medical college Jaipur. 27% of asphyxiated babies were born elsewhere who were admitted in Sir padampat mother and child health institute Jaipur were included in the study. Brown et al (4) included 11.7% of babies in their study who were born elsewhere.

In the present study, on the basis of clinical symptoms we found that asphyxiated group males comprised 62% cases and females 38% cases male female ratio was 1.63:1.0 it is statistically insignificant as compared to control group where male female ratio was 2.59:1. In Mild and moderate asphyxia males preponderance was seen while in severe asphyxia the difference was not marked. There was no statistically significant sex difference in birth asphyxia. DSouza et al (10) (Males 65.4%), and Martin et al (6) (Males 54.5%). The higher incidence of asphyxia in males can be explained on the basis of preferential care of male child as compared to female which is reflected in the control group also (Males 54%).

In the present study, Endotracheal intubation was required, in 36% of cases to revive them while and bag and mask was used in 49% cases. In severely asphyxiated babies the ETT was used in 75% babies while bag mask was used in 25% cases only. In mildly asphyxiated group 60% babies were resuscitated by suction of throat, nasopharynx and physical stimulation and 40% needed bag and mask ventilation moderately asphyxiated group bag and mask was used more frequently than ETT 82.8% and 17.14% respectively. Thus, in severely asphyxiated babies the ETT was used more frequently as pared to mild and moderately asphyxiated babies. Our observations are in agreement with those of Brown et al (4) who ETT in 88% of 94 severely asphyxiated babies and Thomson et al (11) who used ETT in 84% of severely asphyxiated babies. Our observation differ from the study of Daga et al (12) who used Bag and Mask in greater number (58.9%) and ETT in 30.4%. At our center the protocol is to use ETT early and more frequently in severely asphyxiated babies and hence the difference.

CONCLUSION

We concluded from the present study that the male to female ratio in asphyxiated babies was 1.62 and there was no statistically significant sex preponderance in birth asphyxia (P > 0.05). In resuscitation of mild and moderately asphyxiated babies Bag and Mask was used more frequently (40% and 82.5% respectively) and endotracheal tube with Ambubag was used more frequently for severely asphyxiated babies.

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