

Prevalence and immediate outcomes of Hypoxic Ischaemic Encephalopathy (HIE) among infants with birth asphyxia admitted at the neonatal ward of Muhimbili National Hospital in Dar es salaam, Tanzania

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ABSTRACT

OBJECTIVE

To determine the prevalence and immediate outcome of infant with hypoxic ischemic encephalopathy (HIE) admitted at the Neonatal ward [ward 36] of Muhimbili National Hospital.

METHODOLOGY

Prospective cohort hospital based study at the neonatal unit of Muhimbili National Hospital (MNH). It involved neonates with either low apgar score (score \leq 7 at 5 minutes) and/or those young infants that were found to have symptoms and signs suggestive of HIE. Data were collected using a checklist, and analysed using Epi-info computer program.

RESULTS

The study showed the prevalence of birth asphyxia at neonatal ward MNH to be 30.9% and among these, 92 neonates (82.1%) had HIE. Mortality due to HIE was 27.2%. Majority of neonates with mild HIE (92.3%) was discharged to their mothers while majority of those with severe HIE (51.6%) died.

CONCLUSION

A total of 92 neonates were recruited in the study. The prevalence of birth asphyxia at the Neonatal ward MNH from 13th may to 31st may 2007 was 30.9%.h 27.2%. 92.3% of neonates with Mild HIE discharged within seven (7) days while more than half those with severe HIE (51.3%) died and 72% of deaths occurred within first three (3) days of life. Also the less the severity of HIE the less time of stay in the ward and the earlier the neonates started breastfeeding while the vise versa is true.

RECOMMENDATION

HIE score chart is simple to use and its correct use can predict the prognosis of the neonates with HIE

INTRODUCTION

Birth asphyxia is defined as a delay in establishing spontaneous respiration upon delivery of the newborn¹ it causes impaired gas exchange leading to progressive hypoxemia and hypercapnea with significant metabolic acidosis². Its severity has been related to the degree of depression of the Apgar score^{3,4} or by presence of cord blood acidosis.

Hypoxic ischemic encephalopathy (HIE) is the term commonly used to describe the neurological syndrome that occur following perinatal asphyxia. It is usually caused by severe birth asphyxia with secondary cerebral ischemia⁶. It is an important cause of permanent damage to the central nervous system (CNS) which may result in neonatal death or manifest later as cerebral palsy or mental deficit⁷. It has long been known that survivor of HIE are at increased risk of neurological handicap^{8,9}.

Since Tanzania is among those countries with limited

resources especially in the labour ward which make birth asphyxia to be one of the leading cause of the infant mortality rate (WHO report) and there are very few done in our setting to show the immediate outcome of infant with HIE.

Such high mortality due to the poor labour wars services necessitate more analytical studiosto give a picture on the magnitude of the problem in our setting. This may also bring a light to the healthcare personnel so as to improvise their services during antenatal period and delivery.

METHODOLOGY

This was a prospective hospital based study that was conducted for a period of three weeks at the neonatal unit of Muhimbili National Hospital (MNH). It involved 92 neonates with either low apgar score (score \leq 7 at 5 minutes) and/or those young infants that were found to have symptoms and signs of HIE (namely apnoea,

respiratory arrest, impaired sucking, swallowing or feeding difficulties as reported by mothers).

Data were collected using a formulated checklist observing the Apgar Scores, symptoms of HIE. The neonates who satisfied the inclusion criteria then were further followed up dosing the study period, new neonates with HIE observed during follow-up period were also enrolled.

The data was coded and screened for errors before entering into Epi-info v2002 statistical program for data analysis. Ethical clearance for the conduct of this study was obtained from the Muhimbili university of health and allied sciences (MUHAS) directorate of research and Publications via the Office of the Head, Department Of Paediatrics and Child Health MUHAS. Permission to do the study at the neonatal unit was granted by the sister-in-charge of the neonatal unit of MNH.

RESULTS

A total of 362 neonates were admitted during the time of the study from 13th may to 31st may 2007 in which 112 (30.9%) neonates had birth asphyxia. Among these (30.9%), 92 neonates (82.1%) had HIE (Apgar score of less than 7 in five minutes) During the time of the study 103 neonates died in ward 36 which account for mortality of 25.5%. Among these deaths 27.2% contributed by neonates with HIE.

Table 1: PREVALENCE OF NEONATES WITH HIE (APGAR SCORE OF LESS THAN 7 IN 5MINUTES)

APGAR SCORE	FREQUENCY	PERCENTAGE
Less than 7	92	82.1
Above 7	20	17.9
Total	112	100

Of all neonates admitted due to birth asphyxia 92 (82.1%) had Apgar score less than 7 in five minutes.

DISCUSSION:

During the time of the study 103 neonates died in ward 36 which accounted for mortality of 25.5% and among these deaths 27.2% contributed by neonates with HIE. These results are almost the same with a similar study that of which showed the prevalence of 25% and mortality of 26.4% 5. The slightly increase can be due to time limit of the study which made to use a small sample size.

From the study majority of neonates with mild HIE (92.3%) weredischarged to their mothers while majority of those with severe HIE (51.6%) died or not responded within seven days (25.8%). Among these deaths due to severe HIE 72% occurred within first three days of life. These can be compared to results from a study which showed mortality due to severe HIE to be 50 – 75% and 55% of the deaths occurred within first month of life¹². The cause of death can be due to multiple organ failure, infants with severe neurological disabilities, aspiration pneumonia or systemic infections and poor care.

The study showed that as severity of HIE decreases (mild) the less time the neonates stayed in the ward (1 – 3 days) and as the severity increases the more time (above 7days) the neonates stayed in the ward. This can be due to the fact that those with severe HIE had severe cerebral damage and hence poor outcome and poor prognosis.

TABLE 2: PROPORTIONAL OF HIE SCORE IN NEONATES WITH BIRTH ASPHYXIA

GRADE	FREQUENCY	PERCENTAGE
Mild HIE (1 – 4)	26	28.3
Moderate HIE (5 – 9)	35	38.0
Severe HIE (10 – 22)	31	33.7
Total	92	100.0

Of the neonates studied most of them (38.7%) had moderate HIE.

TABLE 3: GRADE OF HIE VS IMMEDIATE OUTCOME

GRADE	IMMEDIATE OUTCOME			TOTAL
	DISCHARGE	DEATH	NO. RESP IN 7 DAYS	
Mild HIE	24 (92.3%)	1 (3.8%)	1 (3.9%)	26 (100%)
Moderate HIE	22 (62.9%)	8 (22.9%)	5 (14.3%)	35 (100%)
Severe HIE	7 (22.6%)	16 (51.6%)	8 (25.8%)	31 (33.7%)
Total	53 (57.6%)	25 (27.2%)	14 (15.2%)	92 (100%)

Majority of neonates with mild HIE (92.3%) discharged to their mothers while majority of those with severe HIE (51.6%) died or not responded within seven days (25.8%) (P = 0.0000)

TABLE 4: IMMEDIATE OUTCOME VS DAYS OF STAY IN THE WARD

IMMEDIATE OUTCOME	DAYS OF STAY IN THE WARD			TOTAL
	1 – 3 DAYS	4 – 7 DAYS	ABOVE 7 DAYS	
Discharge	23 (43.4%)	30 (56.6%)	0(0.0%)	53 (100%)
Death	18 (72.0%)	7 (28.0%)	0 (0.0%)	25 (100%)
Not resp. in 7 days	0 (0.0%)	0 (0.0%)	14 (100%)	14 (100%)
Total	41(44.6%)	37 (40.2%)	14 (15.2%)	92 (100%)

Majority (72%) of the deaths occurred in the first three days of life and 100% of those who did not respond within 7 days of follow up stayed in the ward more than 7 days (P = 0.0000)

Also from the study it was found that most neonates with mild HIE (92.0%) started breastfeeding within three days while majority of neonates with severe HIE (53.3%) did not start breastfeeding for at least a week of follow up. This could have been explained by the fact that neonates with severe HIE had severe cerebral damage hence lost their survival reflexes for a longer period of time.

CONCLUSION

The prevalence of birth asphyxia in Neonatal ward MNH from 13th may to 31st may 2007 was 30.9%. Mortality in neonatal ward at that time was 25.5%, in which 27.2% was due to Hypoxic ischemic encephalopathy (HIE). 92.3% of neonates with Mild HIE discharged within seven (7) days while more than half those with severe HIE (51.3%) died and 72% of deaths occurred within first three (3) days of life.

Also the less the severity of HIE the less time of stay in the ward and the earlier the neonates started breastfeeding while the vice versa is true.

RECOMMENDATIONS

Health workers have a duty to play so as to reduce severity and outcome of birth asphyxia and severe HIE. High risk pregnancy needs to be identified so that suitable mode of delivery can be planned. Mothers with high risk like Cephalo-pelvic disproportion (CPD) should not be allowed to deliver by spontaneously vertex delivery (SVD)

Proper education should be given to all women of reproductive age; this includes taking a good care of their health so that they will conceive at reasonable age and at a good healthy state to reduce any complication during pregnancy.

HIE score chart is simple to use and its correct use can predict the prognosis of the neonates with HIE

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