

Outcome Significance of Perinatal Versus Postnatal Fetal Depression, a Comparative Study

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Abstract

Background: Hypoxic-ischemic encephalopathy HIE, causing significant mortality and long-term morbidity as a perinatal depression with cord pH <7.00, Apgar score <3 at 5 minutes of age with multiple organ involvement .Another form of depression when newborn's was born fine then insult seriously within the first seven days of life.

Objective: Compare the outcome of perinatal to those with postnatal fetal depression.

Materials and Method

Retrospective study of infants admitted at birth or within the first 7 days of life to neonatal or pediatric intensive care and followed over 18months in the women's and Hamad teaching hospitals, Doha, Qatar.

Results: Forty four cases in the study 22 in each group, mean gestational age 36.8wks for group 1with perinatal HIE compared to 38.8wks for group 2 postnatal HIE(P value 0.04), Apgar score significantly different, all cases in group1 required resuscitation compared to 8 cases in group 2 (P value 0.00).

Conclusion: The outcome of cases of postnatal HIE was much better than that of Perinatal HIE. Preterm depressed babies present earlier and more severe than term babies.

Abbreviations: NICU neonatal intensive care unit, PICU pediatric intensive care unit, HIE hypoxic ischemic encephalopathy, GA gestational age, ND normal delivery, AND assisted normal delivery ,CS caesarian section.

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Introduction

Hypoxic-ischemic encephalopathy (HIE), remains a serious condition, causing significant mortality and long-term morbidity [1, 2, 3]. In spite of major advances in monitoring technology and knowledge of fetal and neonatal pathologies perinatal asphyxia remains a major concern [4].

HIE is characterized by clinical and laboratory evidence of acute or sub acute brain injury due to asphyxia (i.e., hypoxia, acidosis) [1]. Most often, the underlying

cause remains unknown [5]. The exact time of brain injury often remains uncertain, and an abnormal brain (e.g.

growth failure, impaired development) might be an underlying risk factor [6].

The American Academy of Pediatrics (AAP) and the American College of Obstetrics and Gynecology (ACOG) published guidelines to assist in the diagnosis of severe HIE for the designation of perinatal asphyxia including Profound metabolic or mixed acidemia (pH <7.00) in an umbilical artery blood sample, an Apgar score of 0-3 for at least 5 minutes



and neonatal neurologic sequel (e.g seizures, coma, hypotonia) or multiple organ involvement (e.g of the kidney, lungs, liver, heart or intestines) for typical perinatal HIE [1,7].

Another presented like hypoxic ischemic brain insult may arise after delivery when the newborn's condition antenatal was fine and at birth initially stable with Apgar score more than 3 at 5 minute of age, PH more than 7.0 of arterial cord blood gas but for other undiagnosed, not identified pathologies he or she later on developed a major life threatening insult within the first 7 days of life required resuscitation and admission to intensive care [8].

Material and Methods

The study was a retrospective chart review of the records including delivery room charts recording umbilical cord blood gas of newborn infants admitted to the neonatal or pediatric intensive care units at birth or during the first 7 days of life and followed over 18 months from may 2007 to November 2008 in the women's and Hamad General teaching hospitals, Doha, Qatar to compare the outcome of perinatal/typical hypoxic ischemic encephalopathy with those who developed postnatal/atypical hypoxic ischemic encephalopathy during the first 7 days of life.

Inclusion Criteria

In the first group, any newborn baby admitted to the neonatal intensive care unite

with a suspicion of perinatal depression and/or primary diagnosis of birth asphyxia or hypoxic ischemic encephalopathy was included while in the second group any neonate admitted to pediatric intensive care with neonatal seizures or apneas, lethargy, focal or general neurological findings. Both groups were followed through their charts over 18 months of age.

Exclusion Criteria

Any newborn delivered with multiple congenital anomalies incompatible with life or perinatal team decision for no code or no resuscitation were excluded from the study.

Results

Forty four cases were included in the study 22 in each group. Group 1 with perinatal HIE compared to group 2 of postnatal HIE, The mean gestational age was 36.8wks for group 1 while it was 38.8wks for group2 (P value 0.040). Apgar score were significantly lower in group1 compared to group2 (figure no.1), all cases in group1 required cardiopulmonary resuscitation (CPR) and assisted ventilation compared to 8 (36%) in group 2 (P value 0.00), 2 (9%) of group1 had intracranial hemorrhage compared to 1 (4.5%) in group 2 (9%) (P 0.99), 3(37.5%) in group 1 had cerebral palsy while no cases had it in group 2 (P0.23), 11 (61%) of group 1 had seizures 5 (27.8%) of them discharged on anticonvulsants while 5(27.8%) of group 2 had seizures (P value 0.12) 4 of them discharged on anticonvulsants.

Table 1: Demographic data of the studied group with their significant difference.

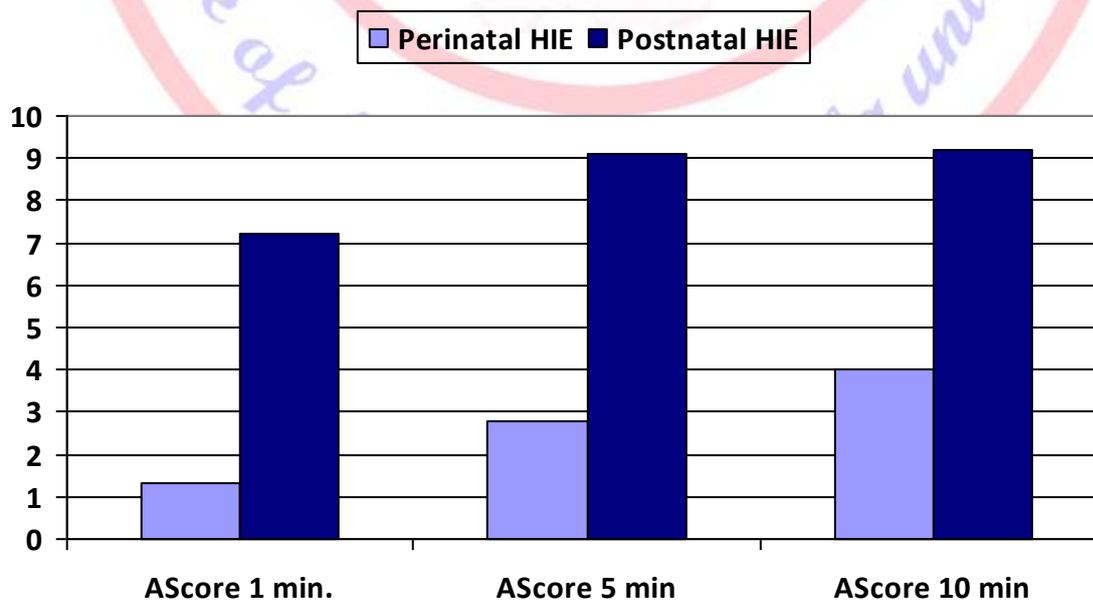
VARIABLES	Perinatal HIE Mean No. 22 cases	Postnatal HIE Mean No. 22 cases	P Value
Mean GA*	36.8 **	38.8 **	0.04
Mean Apgar score at 1 min.	1.3	7.2	0.00
Mean Apgar score at 5 min.	2.8	9.1	0.00
Mean Apgar score at 10 min.	4	9.2	0.04
Mode of delivery#	ND 3(13%) CS 18(78%) AND 2(9%)	ND 12(55%) CS 7(32%) AND 3(13%)	0.005
CPR* & Ventilation	22 (100%)	7(32%)	0.001
Delayed mile stone	8(36%)	1(4.5%)	0.001
Death	11(50%)	1(4.5%)	0.003

*GA Gestational age ** Mean, # Mode of delivery ND normal delivery, CS caesarian section, AND assisted normal delivery (ventouse or forceps delivery) CPR cardiopulmonary resuscitation.

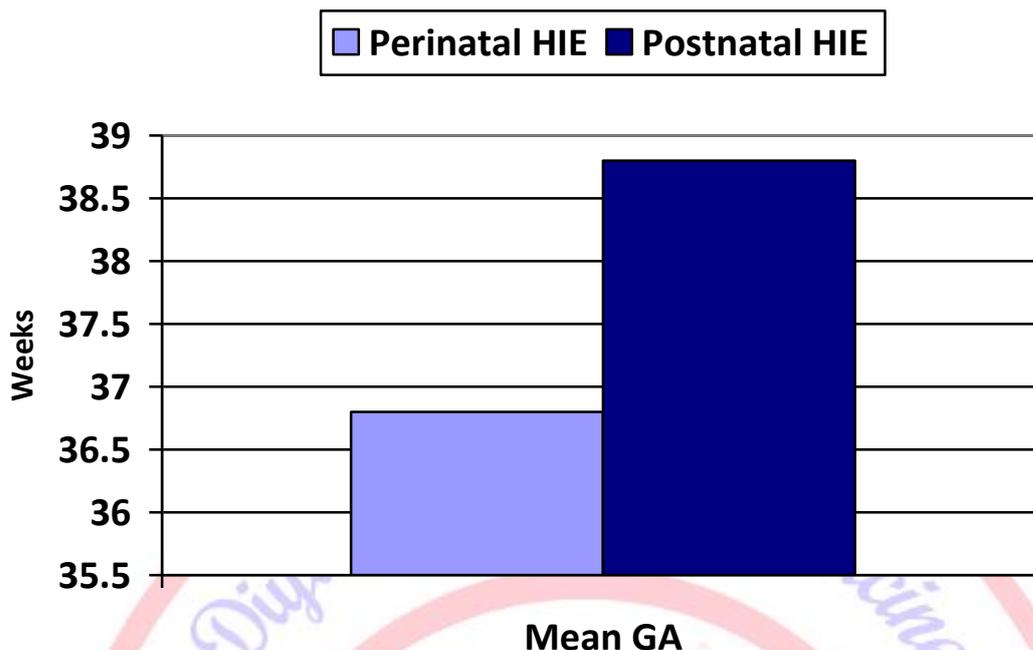
Table 2: Demographic data with non-significant difference.

VARIABLES	Perinatal HIE Mean 22 cases	Postnatal HIE Mean 22 cases	P Value
Age on discharge	16**	13.85**	0.06
Cord PH	6.7	7.05	0.09
Days in hospital	19.5 **	9.5 **	0.06

** Mean



Graph 1: showing the mean Apgar score comparative values.



Graph 2: showing the mean gestation age difference values.

Statistical analysis

The data were analyzed using the Statistical Program for Social Sciences (SPSS 16.0). Chi square and Fisher exact test were used when appropriate to compare the outcome data in both groups of insults. The differences were considered statistically significant at a P value ≤ 0.05 .

Discussion

Although the cases of group 1 were delivered prematurely in a mean compared to group 2 (36.8 wks VS 38.8 wks) and most cases of this group were delivered by caesarian section urgently as shown in the table no.1 despite of that the Apgar score was significantly low, In many institutions, the decision to obtain cord gases is made by the provider attending the birth. In settings where obtaining cord gases is feasible, Gibbs et al. suggest that cord gases should be obtained after delivery of an infant with risk factors for neonatal encephalopathy [8].

The decision to obtain cord gases must be weighed by the individual clinician against the potential benefits to delayed cord clamping, particularly in the preterm infant (higher hematocrit and hemoglobin levels, increased blood pressure, and increased blood volume, fewer days of oxygen and ventilation, and decreased need for transfusions). [9]

Examination of the placenta can be helpful in establishing nonhypoxic and/or antepartum causes of neonatal encephalopathy and/or cerebral palsy. In addition to a thorough gross examination of the placenta at the time of delivery, a microscopic examination of the placenta by a pathologist should be considered in cases where there are antepartum risk factors for neonatal encephalopathy or cerebral palsy. Requirement of resuscitation and assisted ventilation, number of cerebral palsy cases and deaths among group 1 remain significantly high which means that might be the monitoring of the delivery or decision timing for early delivery and caesarian section still need to be done tightly and properly or the resuscitation at birth might be

not done in proper time or by unskilled personnel and still antenatal close monitoring and follow up with high index for perinatal depression suspicion and the early notification to a well trained perinatology team of such cases to be on board all the time.

Maternal perception of fetal movements (FM) is a universally implemented selfscreening, administered and interpreted individually by all pregnant women, with or without guidance from health care professionals showed Improved quality of management of FM and uniform information to improve the value of the existing "selfscreening" of fetal activity was associated with a reduction in stillbirth rates, the concerns that such a quality improvement intervention would increase interventions and iatrogenic injuries, it is likely that the added cost of ultrasound was compensated by reduced use of admissions for induction and repeated follow up consultations[10], still further research is required to identify optimal methods for detecting important reductions in FM to be an effective screening tool for adverse pregnancy outcomes [11].

At present, there is no evidence that any absolute definition of reduced fetal movements is of greater value than maternal subjective perception of reduced fetal movements in the detection of intrauterine fetal death or fetal compromise. Further investigation is required to determine an effective method of identifying patients with reduced fetal movements and to determine the best subsequent management [12].

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antepartum risk factors for neonatal encephalopathy or cerebral palsy.

From the study we found some cases in the second group despite of being given acceptable Apgar score at birth (more than 3 at 5 minutes of age), they still at risk of developing serious life threatening events in early neonatal life This can be explained by inaccurate calculation of Apgar score by the attending staff or they had a serious problem which is not necessarily presented at birth. After delivery observation for 24hrs for low risk deliveries and 48hrs observation for high risk deliveries (preterm more than 35-37weeks,small for date, maternal chronic illness and any baby with antenatally detected problems) are highly recommended.

Recommendations

It is highly recommended that all antenatal high suspicion of fetal depression to be monitored and treated early and highly skilled staff to be on board from the beginning.

We speculate and recommend that lower threshold for caesarian section and tight fetal monitoring might help to reduce the incidence of HIE.

Preterm delivery is all the time a high-risk delivery so we recommend that such delivery should be notified, followed and controlled by a full skilled perinatology team (obstetrician and neonatologist).

Conclusion

The outcome of cases of Atypical/Postnatal HIE was much better than that of typical/Perinatal HIE.

The preterm babies perinatally depressed will present soon after birth while depressed term babies might present later.



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