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AN OBSERVATIONAL STUDY OF VARIOUS CLINICAL PRESENTATIONS OF NEONATAL SEIZURES WITH THEIR RELATIVE FREQUENCY AND THEIR CORRELATION WITH ETIOLOGY.

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Abstract
The study has been conducted in the neonatal unit of IMCHRC Indore Madhya Pradesh. This is a tertiary care teaching hospital.
Overall most common etiology of neonatal seizures in our study was sepsis (64.9%), followed by birth asphyxia 48.3% cases, hypoglycemia (25%) & hypocalcaemia (21.6%)
Birth asphyxia is the most common cause of subtle seizures and sepsis led to tonic seizures.
The most common aetiology for neonatal seizures is sepsis. This is because the study was conducted in a Medical college placed in rural area, in which patients are coming from villages and rural background, where concept of hygiene is poor, so source of infection was higher. Patients of Birth Asphyxia are less, since our hospital is of tertiary care level where inborn patients are given good perinatal care. Due to lack of knowledge & awareness of infant feeding we got cases of hypoglycaemia& electrolyte imbalance. Onset of seizures during first 3 days of life has significant correlation with HIE as aetiology. Most of the newborn are term & male preponderance was found. Subtle seizures are commonest type of clinical seizures, which were difficult to identify, therefore careful observation of at risk newborns is necessary.
Keywords: Clinical, Seizures, Neonates & Etiology.

INTRODUCTION:

Seizures are the most common and distinct clinical manifestation of neurological dysfunction in the newborn infant.1 Neonatal seizures are a common neurological problem in neonates with a frequency of 1.5-14/1000 neonates. The occurrence of neonatal seizures per se has been positively correlated with structural brain damage and its consequent sequels at later stages in life. Historically seizures were divided in following clinical categories viz. focal clonic, multifocal clonic, tonic, myoclonic, & subtle seizures.1 Diverse medical conditions in the newborn can be associated with neonatal seizures. Hypoxia-ischemia is nonetheless traditionally considered the most common cause of neonatal seizures.[1,2]

Seizures are usually identified by direct clinical observation. However, it is often not well defined in new born babies. Craig in 1959 gave details about clinical presentations of neonatal seizures. He observed tonic phase followed in succession by clonic movements and unconsciousness; of isolated prolonged tonic incidents; and both brief and persistent clonic phase, not preceded by the tonicity or it would followed by unconsciousness.[3] Violent generalized convulsions were rarely seen in premature babies. Rhythmic clonic movements were common; involved one or several limbs at any one times; frequently affected different limbs at different times, and were often associated with transient unilateral twitching of muscles at the angle of mouth or eyes. Associated cyanosis, neck rigidity and opisthotonus were occasional findings.[4]

Material & Method

The study has been conducted in the neonatal unit of IMCHRC Indore Madhya Pradesh. This is a tertiary care teaching hospital.

Design:

- Prospective, observational study

Inclusion criteria:

- Children between 1-28 days will be included.

- All neonates presenting with seizure and admitted to neonatal unit of IMCHRC, Indore Madhya Pradesh.
- Children having low blood glucose levels in routine neonate checkup.
- Both intramural and extramural admitted neonate.

Exclusion Criteria:

Following group of neonates will be excluded-

1. Children >28 days
2. Neonates with isolated subtle phenomenon, apnoea or paroxysmal autonomic changes, i.e., only subtle motor movements or apnoea without tachycardia or hypertension will be excluded from the study.
3. Neonates with titanic spasms.
4. Neonates having jitteriness.

Newborns will be enrolled through preformed proforma with due consent of parents .A detailed antenatal, natal and postnatal history along with history of current seizure type will be obtained. All neonates will undergo a detailed examination including vitals, general physical examination and neurological examination.

Statistical Analysis

Descriptive statistics was analyzed with SPSS version 17.0 software. Continues variables are presented as mean ±SD. Categorical variables are expressed as frequencies & percentages.

Results

Table 1: Distribution of neonatal seizures according to frequency of etiology-

Diagnosis	Total cases(n)	%
Sepsis(EONS ,LONS ,Meningitis, Pneumonia)	39	64.97%
Birth asphyxia	29	48.3%
Hypoglycemia	15	25 %
Hypocalcaemia	13	21.6%
Meconium aspiration syndrome	11	18.3%
Polycythemia	7	11.67%
Shock	4	6.67%
Apnoea	2	3.3%
Disseminated Intravascular Coagulation	1	1.67%
Urinary tract infection	1	1.67%
Multiorgan dysfunction syndrome	1	1.67%
Intraventricular hemorrhage	1	1.67%
Intraparenchymal hemorrhage	1	1.67%
Acute Biliribin Encephalopathy	1	1.67%
Lung Collapse	1	1.67%
Communicating hydrocephalus	1	1.67%

Overall most common etiology of neonatal seizures in our study was sepsis (64.9%), followed by birth asphyxia 48.3% cases, hypoglycemia (25%) & hypocalcaemia (21.6%)

Table 2: Distribution of type of Neonatal Seizures in relation to type of seizure with etiology.

Diagnosis	Total cases(n)	%	Type of seizures	Total cases
Sepsis(EONS ,LONS)	39	64.97%	Subtle	16
			Tonic	14
			Clonic	3
			Myoclonic	6
Birth asphyxia	29	48.3%	Subtle	17
			Tonic	8
			Clonic	2
			Myoclonic	2
Hypoglycemia	15	25 %	Subtle	7
			Tonic	5
			Myoclonic	3

Hypocalcaemia	13	21.6%	Subtle	8
			Tonic	3
			Clonic	1
			Myoclonic	1
Meconium aspiration syndrome	11	18.3%	Subtle	9
			Clonic	2
Polycythemia	7	11.67%	Subtle	3
			Tonic	1
			Clonic	1
			Myoclonic	2
Disseminated Intravascular Coagulation	1	1.67%	Subtle	1
Urinary tract infection	1	1.67%	Myoclonic	1
Multiorgan dysfunction syndrome	1	1.67%	Myoclonic	1
Intraventricular hemorrhage	1	1.67%	Tonic	1
Intraparenchymal hemorrhage	1	1.67%	Subtle	1
Acute Biliribin Encephalopathy	1	1.67%	Tonic	1
Communicating hydrocephalus	1	1.67%	Subtle + myoclonic	1

Birth asphyxia is the most common cause of subtle seizures and sepsis led to tonic seizures.

Discussion

Neonatal seizures (NS) is the most frequent and distinctive clinical manifestation of neurological dysfunction in the newborn infant. Infants with Neonatal Seizures are at a high risk of neonatal death or neurological impairment/epilepsy diseases in later life. Though mortality due to Neonatal Seizures had decreased from 40% to almost 20% over the years, the prevalence of long-term sequelae in neurodevelopment has largely remained unchanged at around 30%.

We found multiple cause for neonatal seizure in our study except for 9 cases in which a distinct etiology was found), for others, multiple etiologies were clubbed to find out most common cause of neonatal seizure. Sepsis was found to be the most common cause seen in in 64.97% (39) cases followed by birth asphyxia and HIE which was found in 48.3% (29) cases. Hypoglycaemia seen in 15 cases (25%) &hypocalcemia in 13 cases (21.6%). However, **MCBRIDE MC et al**[5] conducted a study on 109 neonates in which most common cause of neonatal seizures was perinatal asphyxia which comprised of 63 cases (57.80%) and sepsis was found to be the second most common cause followed by metabolic (hypoglycaemia and hypocalcaemia). A study in 159 neonates and also found HIE as the commonest cause of seizure (44.03%) followed by metabolic disturbances and sepsis was found to be the third most commonest cause. In study conducted by **Adeebah**[6] which comprised of 122 neonates HIE was found to be the most common cause with 41 neonates (33.6%) followed by metabolic (hypoglycaemia& hypocalcaemia) seen in 36 cases (29.5%) &infection seen in 20 cases (16.4%). The reason for this discrepancy might be that major babies in our study were out born in comparison to above studies and that increases chances of infection. We did not find any case of pyridoxine dependency or any neonatal syndrome in our study, Also HIE was relatives lower due to better neonatal care in the hospital.[7]

Conclusion

The most common aetiology for neonatal seizures is sepsis. This is because the study was conducted in a Medical college placed in rural area, in which patients are coming from villages and rural background, where concept of hygiene is poor, so source of infection was higher. Patients of Birth Asphyxia are less, since our hospital is of tertiary care level where inborn patients are given good perinatal care. Due to lack of knowledge & awareness of infant feeding we got cases of hypoglycaemia& electrolyte imbalance. Onset of seizures during first 3 days of life has significant correlation with HIE as aetiology. Most of the newborn are term & male preponderance was found. Subtle seizures are commonest type of clinical

seizures, which were difficult to identify, therefore careful observation of at risk newborns is necessary.

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