

## Clinical Profiling of Neonatal Seizures in a Tertiary Medical center in Eastern India

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### Abstract:

**Background:** The immature brain seems more prone to seizures than the more mature brain. Seizures are more common in the neonatal period than during any other time throughout life. Seizures in the neonatal period are also the most common neurological emergency and are associated with high mortality and morbidity

**Objectives:** To find out the clinical profile of seizures in neonates admitted in a Tertiary care hospital.

**Materials and Methods:** The study was cross sectional, observational & analytical in nature, performed over a period of 1 year. Data were analyzed in Microsoft Excel using standard statistical techniques.

**Results:** Study population comprised of 59 baby boy and 41 baby girl, 67% were term, 80% AGA & 54% were born via vaginal delivery. In our study 47% of the babies had developed seizures in the first 24 hrs of birth, 76% within 72 hrs and 97% had their seizures in the first 7 days of life. Frequencies of different types of seizures in our study were clonic in 40%, subtle in 34%, myoclonic in 1% and tonic in 25%. We found clonic variety was the major type of seizures in premature babies, while in full term infants clonic and subtle seizures (25% each) were the predominant type.

**Conclusion:** Male sex, term, AGA, babies born via Vaginal delivery & 1st 3 days of post natal age are associated with increased risk of neonatal convulsion. Clonic convulsion was found to be most common phenotype in our study, followed by subtle seizure.

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### I. Introduction

Neonatal seizures differ in clinical description from those in adults, and seizures in preterm infants differ from those in term infants. Cerebral cortical organization, synaptogenesis, and myelination of cortical efferent pathways are poorly developed in human neonates, leading to weakly propagated, fragmentary seizures whose electrical activity may not spread to surface EEG electrodes. The more advanced development within the limbic system with connections to mid-brain and brain stem may explain the higher frequency of mouthing, eye deviation, and apnea in neonates than seizures in adults. Thus the clinical manifestations can be extremely inconspicuous in neonates. The immature brain seems more prone to seizures; these are more common in the neonatal period than during any other time throughout life. This may reflect the earlier development of excitatory synapses, predominating over inhibitory influences at early stages of maturation.<sup>1</sup> The incidence of seizures in infants born at term is 0.5-3 per 1000 live births; the incidence is even higher in preterm infants, ranging from 1-13% of very low birthweight infants<sup>2</sup>. Our study aims to find out the clinical profile of seizures in neonates admitted in a Tertiary care hospital.

### II. Material And Methods

The study was cross sectional, observational & analytical in nature, performed over a period of 1 year (May 2016 to April 2017). Data were collected in a predesigned proforma. We organized & analyzed data in Microsoft Excel 2010 using standard statistical techniques.

### III. Results And Analysis

Title: Distribution of study population according to sex (N=100)

Table no.1

Sex	Frequency	Percentage
Boy	59	59%
Girl	41	41%

Our study population comprised of 59 baby boy and 41 baby girl, who presented with or developed convulsions during their course of stay in our hospital during the first 28 days of their life.

Distribution of study population according to gestational age (N-100)

**Table no.2**

Gestational age	Frequency	Percentage
Preterm	29	29%
Term	67	67%
Post term	4	4%

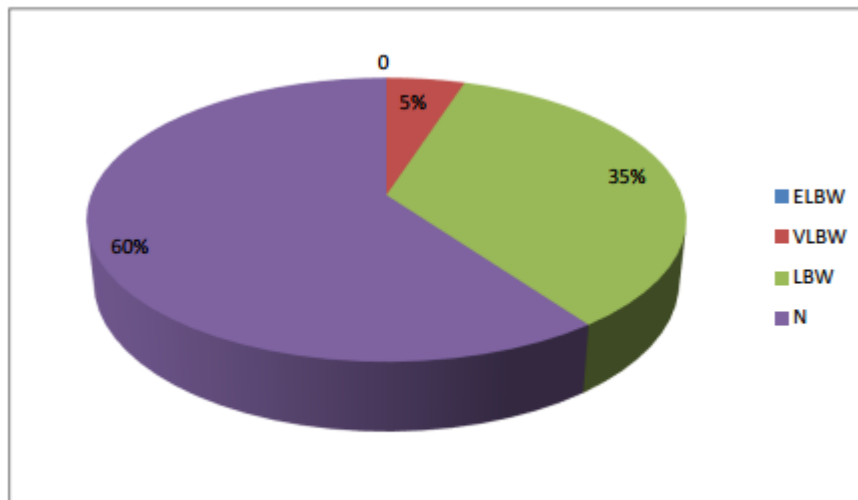
The above table shows Neonatal Convulsion most commonly occurring amongst term newborns.

Title: Distribution of study population according to weight for gestational age (N-100)

**Table no.3**

Gestational age	Frequency	Percentage
Large for gestational age (LGA)	4	4%
Appropriate for gestational age (AGA)	80	80%
Small for gestational age (SGA)	16	16%

**Figure 1**



**Distribution of study population according to birth weight**

Most of the convulsions occurred among normal birth weight Newborns

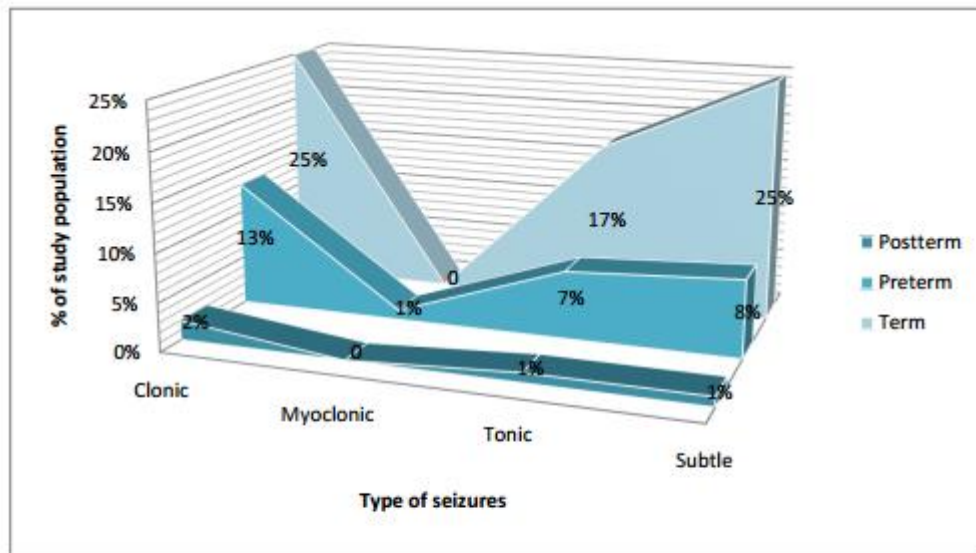
Title: Distribution of study population according to mode of delivery (N-100)

**Table no.5**

Mode of delivery	Frequency	Percentage
Lower Segment Caesarean Section (LSCS)	42	42%
Assisted	4	4%
Normal Vaginal Delivery (NVD)	54	54%

Neonatal seizures were higher among babies born via vaginal delivery.

Figure No 2:



Distribution of study population according to type of seizure and gestational age

Title: Distribution of study population according to onset of seizure in neonatal period (N-100)

Table no.6

Distribution of study population according to onset of seizure in neonatal period From table no. 6 we can see that maximum number of babies had their firstconvulsion within 24 hrs of birth (47%) and another 29% babies had seizureonset in the next 48 hrs, so that by 72 hrs of life 76% babies had their firstepisode of convulsion.

Onset of seizure (day of life)	Frequency	Percentage
1st	47	47%
2nd	16	16%
3rd	13	13%
4th	13	13%
5th	6	6%
6th	1	1%
7th	1	1%
8th day onward	3	3%

Title: Distribution of study population according to type of seizure (N-100)

Table no.7

Type of seizure	Frequency	Percentage
Clonic	40	40%
Myoclonic	1	1%
Subtle	34	34%
Tonic	25	25%

#### IV. Discussion

Our study showed that males were affected more with seizures (59%). This is consistent with the results of work done by Malik AR et al, Sabzehei et al Talebian et al and Alcover et al showing predominance of neonatal seizure in males.<sup>3,4</sup> We have found neonatal seizures to be more in term babies as was seen in work done by Sabzehei et al and Malik AR et al and the percentage is even higher in works done by Shahjad et al and Talebian et al.<sup>3,4,5,6</sup>

The proportion of VLBW, LBW and normal weight babies were 5%, 35% and 65% respectively in our study. This matched with the results of Shahjad et al but varied with that of Sabzeheiet al.<sup>7</sup>

In the present study on neonatal seizures 80 neonates were Appropriate for gestational age, 16 neonates were small for gestational age and 4 neonates were Large for gestational age. This results were comparable with studies done by Nawab et al ,Roshith et al and Saliba et al<sup>8</sup> but differed from Aziz et al<sup>9</sup>

In our study 47% of the babies had developed seizures in the first 24 hrs of birth, 76% within 72 hrs and 97% had their seizures in the first 7 days of life. In the study done by Shahjad et al first day seizures were seen in 36%, 69% during initial 72 hours, 81% of the neonatal seizures were in the first week of life. Sahana et al found that 51.37% of neonates have developed seizures on first day and 77.98% within 72 hrs.<sup>17</sup> Abdur RM et al found 80% seizures occurring in the first week.<sup>8</sup> Malik et al and Tekgul et al had also found maximum number of seizures occurring in the first 10 days of life.<sup>10,11</sup> Frequencies of different types of seizures in our study were clonic in 40%, subtle in 34%, myoclonic in 1% and tonic in 25%. We found clonic variety was the major type of seizures in premature babies, while in full term infants clonic and subtle seizures(25% each) were the predominant type.

## V. Conclusion

Male sex, term, AGA, babies born via Vaginal delivery & 1st 3 days of post natal age are associated with increased risk of neonatal convulsion. Clonic convulsion was found to be most common phenotype in our study, followed by subtle seizure. The subtle nature of seizure may be the reason for it's less prevalence in our study as it was based on clinical parameters.

## AUTHORSHIP INFORMATION:

DrGayen S: Study conceptualization; manuscript editing; Das PS: analysis and manuscript writing ;DrSaha RP: data collection, analysis. All authors approved final version of manuscript.

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