

# Assessment of Clinical and Investigative Profiles and Treatment Approaches in Newborns with Birth Asphyxia Admitted to Pravara Rural Hospital, Loni. [BK]

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## Abstract

**Introduction:** The inability to intake sufficient oxygen into the lungs increases the likelihood of hypoxia. Hypoxia is a condition in which there is an inadequate supply of oxygen reaching the body's cells and tissues. Hypoxia can result in various serious and potentially life-threatening complications. But if you know what to look for, you can manage the condition before it leads to dangerous complications. You may have heard of both hypoxia and hypoxemia. **Methodology:** A 100 sample are in this study Research approach is with evaluative approach was used Research design is Descriptive longitudinal research design in this study independent variable clinico-investigative profile and treatment trends In this study depended variable are newborns with Birth Asphyxia admitted The study conducted Neonatal unit, [ward no 5 and 16] situated at ground floor and second floor of Pravara Rural Hospital, Loni, Bk. In the context to present study, Newborns admitted in Neonatal unit, [ward no 5 and 16] at PRH will be population for study. The sample for this study consisted of newborns under 7 days old who met the inclusion criteria. A non-probability convenience sampling technique was employed for the selection process. **Result:** Distribution of neonates as per APGAR score majority 53%. Symptoms represented by the neonates were showing that 58% heart rate less Resuscitative Measures taken for the Neonates to initiate the Breathing were as follows Ambubag used for the 57%. SARNAT scoring for classification of Asphyxia as per score value indicating that Majority 45% clinic-investigative profile of the neonates to initiate the treatment the value represents majority of neonates 56% Neurological dysfunction and treatment trends in the study group as per the clinical investigative profile Majority 40% had developed hypoxic encephalopathy followed Correlation of clinico-investigative profile of birth asphyxia with their effectiveness of treatment. There was no correlation between Treatment SARNAT. There is no correlation between Apgar score and Post treatment of SARNAT score as management of birth asphyxia. Correlation of Clinical outcome of the Neonate and effectiveness of treatment pathway correlation of clinical outcome of effective treatment of birth asphyxia 39% of the neonate was improved well from birth asphyxia. Correlate clinico-investigative profile and treatment trends with Demographic Variable. The overall experience of conducting this study was gratifying, as there was a positive response to the cheek and lip stimulation methods used. The study also provided a valuable learning opportunity for the investigator. **Conclusion:** clinical outcome of effective treatment of birth asphyxia 39% of the neonate was improved well from birth asphyxia. Remaining 25% were still under treatment and 16% have got discharge after effective treatment and 10% of the neonate have dead due to severe complication of birth asphyxia. But the table does not show any specific correlation with any of the close relation with treatment and management of neonates.

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Received Date: August 29, 2024

Accepted Date: October 25, 2024

Published Date: November 10, 2024

**Citation:** Savita Vaibhav Shelke. Assessment of Clinical and Investigative Profiles and Treatment Approaches in Newborns with Birth Asphyxia Admitted to Pravara Rural Hospital, Loni. [BK]. International Journal of Pediatric Nursing. 2024; 10(2): 24–30p.

**Keywords:** Lungs, birth asphyxia, severe complication, clinico-investigative profile, demographic variable

## INTRODUCTION

Asphyxia neonatorum is a condition that occurs when a newborn does not receive enough oxygen during the birthing process. It is also commonly referred to as perinatal asphyxia or birth asphyxia. This term describes a lack of oxygen and blood flow to the brain. Birth asphyxia happens when a newborn's brain and other organs fail to get adequate oxygen and nutrients before, during, or immediately after birth. Without these vital elements, cells cannot function correctly, leading to the buildup of waste products that can cause damage. The World Health Organization (WHO) defines asphyxia as "the failure to initiate and sustain breathing at birth." It is a major contributor to neonatal mortality globally, responsible for 24% of all neonatal deaths and 11% of deaths in children under five. Asphyxia can stem from conditions that develop before birth or arise immediately in infants who need resuscitation. Most cases of perinatal asphyxia occur during labor, while 20% happen before labor, and some occur in the early postnatal period [1–3].

Perinatal asphyxia can result from various factors, including maternal, placental, uterine, and fetal issues. Studies from various countries have indicated that significant causes of birth asphyxia include low birth weight, cesarean delivery, multiple births, lack of antenatal care, maternal age, gravidity, mode of delivery, prolonged labor, and fetal distress. Risk factors for asphyxia include mothers aged between 20 and 25 years, multiple births, failure to attend prenatal care, low birth weight, abnormal fetal positions during delivery, preeclampsia or eclampsia, and a history of birth asphyxia in previous pregnancies [4]. The Signs and symptoms are divided into before, during, or just after birth like- low blood pH levels, lack of oxygen, baby being silent and not crying, low heart rate, weak muscle tone, weak reflexes, lack of breathing or difficulty in breathing, amniotic fluid stained with meconium, seizures, signs of poor health in newborns include poor circulation, lethargy, low blood pressure, reduced urination, abnormal blood clotting, and a low Apgar score. The Apgar score evaluates five criteria: Appearance, Pulse, Grimace, Activity, and Respiration. Healthcare professionals assign a rating from 0 to 10 based on the newborn's health status. A low Apgar score (between 0 and 3) that lasts for more than 5 minutes can indicate birth asphyxia [5].

## NEED FOR STUDY

### Worldwide

Each year, 2.5 million infants die within their first month of life, with approximately 25% of all neonatal deaths attributed to birth asphyxia. International reports indicate that birth asphyxia is the third leading cause of neonatal deaths, following infections and preterm birth due to perinatal asphyxia. The trend in developed countries also indicates a 2/1000 birth rate of asphyxia, resulting in a 10%–15% mortality rate at NICUs [1].

### WHO

A report from the WHO indicates that perinatal asphyxia is the third leading cause of deaths among children under 5, accounting for 11% of such fatalities, following preterm birth at 17% and pneumonia at 15%. In developing countries, neonatal deaths account for 52% of all under-five mortality in South Asia, 53% in Latin America and the Caribbean, and 34% in sub-Saharan Africa [2].

### UNICEF

India, with the birth of 25 million children annually, accounts for nearly one-fifth of the world's total child births. The primary causes of newborn deaths include prematurity (35%), neonatal infections (33%), birth asphyxia (20%), and congenital malformations (9%) [3].

### Objectives

1. To evaluate the clinical and investigative profile, as well as the treatment approaches, used for newborns.
2. To correlate the clinico-investigative profile of birth asphyxia with their treatment trends.
3. To correlate clinico-investigative profile and treatment trends with demographic variables.

### Operational Definitions

- *Assessment*: In this study Assessment means observing and recording of clinical, investigation profile and treatment trends.
- *Clinico-investigative profile*: In this study Its recording of clinical test or investigation carried out in new-borns.
- *New-born*: In this study Recently or just born baby. [Birth to 7 days].
- *Birth asphyxia*: In this study, the failure to initiate and sustain breathing at birth.
- *Treatment trends*: In this study an assessment, observation and recording of a general direction in which something is developing or changing in treatment of my sample.

### Limitations

There will be no changes in treatment, only observation; assessment will be done by investigators.

### REVIEW OF LITERATURE

In the current study, the review of literature is structured under the following headings:

- a. To evaluate the clinical and investigative profiles as well as treatment trends among newborns.
- b. To analyze the relationship between the clinical and investigative profiles of birth asphyxia and their treatment trends.

### METHODOLOGY

- *Research approach*: In relation to the current study, an evaluative approach will be utilized.
- *Research design*: In this study use the research design is Descriptive longitudinal research design
- *Independent variables*: In this study independent variable clinico-investigative profile and treatment trends
- *Dependent variables*: In this study depended on variable are newborns with Birth Asphyxia admitted
- *Research setting*: The study conducted Neonatal unit, [ward no. 5 and 16] situated at ground floor and second floor of Pravara Rural Hospital, Loni, Bk.
- *Population*: In the context to present study, new-borns admitted in Neonatal unit [Ward no. 5 and 16] at PRH will be population for study.
- *Target population*: In the context to present study, the target population newborns with Birth Asphyxia
- *Accessible population*: In the present context of study, the accessible population newborns with Birth Asphyxia admitted at Pravara Rural Hospital, Loni [Bk]. Participants who were present during data collection and met the inclusion and exclusion criteria set by the researcher were chosen.
- *Sample*: Sample selected for present study comprised of New-borns below 7days those are fulfilling the inclusion criteria (Table 1).
- *Sampling technique*: In this study, a non-probability convenience sampling method was utilized.
- *Sample size*: The sample size for this study consisted of 100 participants who met the sampling criteria and were willing to take part in the research.

**Table 1.** Sample selection criteria.

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"><li>• Newborns with birth asphyxia.</li><li>• Newborns whose mothers are willing to participate in the study and willing to give consent.</li><li>• Mothers who are registered cases of PRH.</li></ul>	<ul style="list-style-type: none"><li>• Unregistered cases.</li><li>• Neonatal congenital anomalies.</li></ul>

### Development of the Tool

- *Section A*: It includes 14 items related to the demographic variables of teachers, designed to gather background information about individuals living in rural areas. Age, Gender Number of

children in family Birth order of the child Immunization status of child Co morbidity illness Duration of breastfeeding.

- *Socio-demographic variables of parents:* Age of Father and Mother Religion Type of family Dietary pattern educational qualifications of parents Occupation of father and mother Family income.
- *Section B:* Clinical profile of newborns- Apgar score, Transitional, Ballard's chart, physical Examination, Anthropometric measurements (Table 2).
- *Section C:* Investigative profile- Respiratory investigation, ABG analysis, vital signs (Table 3).
- *Section D:* Treatment trends (Table 4).
- *Section E:* Newborns outcome (Table 5).

## ANALYSIS AND INTERPRETATION OF DATA

Performa for collecting Socio demographic

- *Part 1:* Mother's demographic variables – like age, education, no. of antenatal visits, distance from hospital to home, Reference services [sub center, PHC] Mode of delivery.
- *Part 2:* New-born's demographic variables – like Days, Gender, order of birth.

Highlight the demographic data of the neonates and mothers age of the mother maximum 30% Mother are from the age group of 21-25 Years. Followed by 27% of the ages of less than 20 years old. And very few are 21% are more than 30 years. Educational Status of mothers are majority of the mothers of neonate are educated up to secondary education 39%. Followed by 30% who are educated up to primary education, very few are educated as graduates and above 16% and none of the mothers are Illiterate. Table 1 above is also highlighted that the Number of antenatal visits conducted by the mothers of neonate's maximum 40% had 3 visits followed by 23% first visit and very few had visits more than 3 almost 13%. The above table describes the value of total distance from the hospital. More than 54% stay from the distance less than 5KM and the remaining are more than 5 km distance. Neonates are referring to Pravara Hospital for the purpose of birth asphyxia are from Private clinic 31%, followed by any other outside place 35%, and Primary health center 25%, very few from the sub center. The above table shows distribution of neonates as per place of delivery the majority are delivered in labor room 41%, followed by 35% are delivered in OT. And 20% are outside delivery very few 4% are vehicle delivery. Neonates admitted in the hospital are within two days of life, 54% followed by 26% at the age of 3 to 4 days, very few are 8% of neonates' life is up to 7 days. Majority is neonate's male 56% and remaining 44% are female baby neonates. Distribution of the neonates as per birth Wt. majority 48% are below the age of 2.5 kg and 40% are between the 2 to 2.5 kg and very few 12% are more than 2.5 kg birth weight.

## DISCUSSION

### Analysis of data related to the Distribution of the Subject as per the clinical Profile of Newborn

- Distribution of neonates as per APGAR score majority 53% are had APGAR score 53% less than 03, followed by 37% are moderate APGAR score 4 to 6 and Mild score 7 to 10 are represented by very few 10% of the Neonates.
- symptoms represented by the neonates were shows that 58% heart rate less than 58% and equal number of then representing respiratory problem and difficulty in Breathing initiate. 60 are then found with Grimiest less motor activity. Secretion and mucus production by the neonates are 65%, and bowel activity diminished almost 20% of the neonates.
- Resuscitative Measures taken for the Neonates to initiate the Breathing were as follows Ambubag used for the 57%, chest compression given for 65% of the Neonates and majority 90% of the neonates required IV fluids, 49% of the neonates given Epinephrine. And 30 neonates are intubated and ventilatory support given to initiate the breathing.
- SARNAT scoring for classification of Asphyxia as per score value indicating that Majority 45% of neonates are mild Asphyxia and followed by 25% are Moderates and 30% are Severe Asphyxia.

- e. clinic investigative profile of the neonates to initiate the treatment the value represent majority of neonates 56% find difficulty in feeding followed by respiratory Distress and Apnea 39%, hyperkalemia 37%, Equal number Hyper bilirubinemia, Hyponatremia and respiratory acidosis 30%, Hypocalcemia 20% and remaining represented by 27% of neonates with hypoglycemia [6].

**Table 2.** Clinical profile of newborns – Apgar score, Transitional, Ballard’s chart, physical Examination, Anthropometric measurements.

1.	Apgar Score	Frequency	Percentage
A	Severe [0–3]	53	53.0
B	Moderate [4–6]	37	37.0
C	Mild [7–10]	10	10.0
2.	Transitional [First 24 hrs. after Birth]	Frequency	Percentage
A	Heart Rate <60	58	58.0
B	Respiration	58	58.0
C	Motor activity	60	60.0
D	Color	38	38.0
E	Mucus production	65	65.0
F	Bowel activity	20	20.0
3.	Resuscitative Measures	Frequency	Percentage
A	Ambubag	57	57
B	Chest compression	65	65
C	IV Fluids	90	90
D	Epinephrine	49	49
E	Intubation and ventilation	30	30.0
4.	SARNAT Score	Frequency	Percentage
A	Mild asphyxia (1–10)	45	45.0
B	Moderate asphyxia (11–14)	25	25
C	Severe asphyxia (15–22)	30	30

Note: N = 100.

**Table 3.** Clinical Investigative Profile of neonates with symptoms of birth asphyxia to initiate the treatment trends.

S.N.	Biochemical Detail	Frequency	Percentage
1.	Hypocalcaemia	20	20.0
2.	Hyponatremia	30	30.0
3.	Hypoglycaemia	27	27.0
4.	Hyperkalaemia	37	37.0
5.	CK-MB	30	30.0
6.	Acute renal failure	10	10.0
7.	Hyper bilirubinemia	30	30.0
8.	Respiratory distress	39	39.0
9.	Apnoea	39	39.0
10.	Feeding difficulties	56	56.0
11.	Respiratory acidosis.	30%	30%

Note: N = 100.

### Neurological Dysfunction and Treatment Trends in the Study Group as per the Clinical Investigative Profile

Majority 40% had developed hypoxic encephalopathy followed by 36% had developed convulsion and 32% had developed abnormal Muscle tone, very few had developed 20% with other complication

to be managed as treatment of neonates with birth asphyxia [7].

**Table 4.** Neurological dysfunction and treatment trends in the study group (1<sup>st</sup> week of life).

S.N.	Variable	Frequency	Percentage
1.	<i>Encephalopathy</i>	40	40.0
2.	<i>Convulsion</i>	36	36.0
3.	<i>Jitteriness</i>	18	18.0
4.	<i>Abnormal; Muscle Tone</i>	32	32.0
5.	<i>Other complication</i>	20	20

Note: N = 100.

**Table 5.** Correlation of clinico-investigative profile of birth asphyxia with their effectiveness of treatment.

Variable Score	Mean	S. D	"r" Value
<i>Clinic investigative profile as per APGAR score</i>	7.8.	3.493	$R = -.030$ $P = .888$
<i>Treatment outcome SARNAT score</i>	6.25	5.598	

Note: N = 100.

### Correlation of Clinico-Investigative Profile of Birth Asphyxia with Their Effectiveness of Treatment

Significant p value for the Pretest Knowledge score and practice score was 0.888 which is more than 0.05 so there was no correlation between Treatment SARNAT. The result was shown score reduction and Post treatment APGAR score Improved well R value was -.030. So, there is no correlation between APGAR score and Post treatment of SARNAT score as management of birth asphyxia [8].

### Correlation of Clinical outcome of the Neonate and Effectiveness of treatment pathway

Correlation of clinical outcome of effective treatment of birth asphyxia 39% of the neonate was improved well from birth asphyxia. Remaining 25% are still under treatment and 16% have got discharge after effective treatment and 10% of the neonate have Dead due to severe complication of birth asphyxia. But the table does not show any specific correlation with any of the close relation with treatment and management of neonates [9].

### Analysis of Data Related to Correlate Clinico-Investigative Profile and Treatment Trends with Demographic Variable

Analysis represents the value correlation between the clinical investigation profile and treatment trends and demographic Variable of the neonates and mothers of the neonates. The significant r value is less than the 1 and standard deviation is more than 1 in all the variables so there is no correlation between the clinical investigation profile and treatment trends and demographic variable of the study.

The overall experience of conducting this study was gratifying, as there was a positive response to the cheek and lip stimulation methods used. The study also provided the investigator with valuable new insights [10].

### CONCLUSIONS

The present study assessed the effectiveness of clinical investigation of the neonates suffering from Birth asphyxia will help to improve knowledge and practice among staff nurses in selected hospitals. Timely and effective treatment measures are helpful for effective management of the neonates with birth asphyxia. Based on the statistical findings it is evident that the knowledge has increased after the in-service education programmed and implication of the study suggestion and study findings.

## REFERENCES

1. Antonucci R, Porcella A, Pilloni MD. Perinatal asphyxia in the term newborn. *J Pediatr Neonat Individual Med.* 2024;3(2):e030269.
2. WHO. Newborns: Improving survival and well-being. Available online at: <https://www.who.int/en/news-room/fact-sheets/detail/newborns-reducing-mortality> [Accessed on September 2020].
3. Addis A. Demographic and Health Survey, Central Statistical Agency, Key Indicators Report, Ethiopia. Available at <https://dhsprogram.com/pubs/pdf/fr328/fr328.pdf> [Accessed on October 2018].
4. Neil Abdu RI. Prevalence of October 2018.in Dilchora Referral Hospital, in Dire Dawa, Eastern Ethiopia, 2018. *CMCH* 2017;14(4). doi: 10.4172/2090-7214.1000279.
5. Seema Shah, et al. Clinico biochemical profile of birth asphyxia in neonates of western Odisha. *Indian J Child Health.* 2024;1(3):114–118.
6. Sadeghnia A, Mohammadpoor S. The investigation of rate of birth asphyxia and its relationship with delivery mode at Shahid Beheshti Hospital of Isfahan during 2013, 2014, and 2015. *Int J Prev Med.* 2019;10:23. doi: 10.4103/ijpvm.IJPVM\_383\_16.
7. Badii C. Brain hypoxia: Causes, symptoms, and diagnosis. Healthline. Available at <https://www.healthline.com/health/cerebral-hypoxia#:~:text=Brain%20hypoxia%20is%20when%20the,possible%20causes%20of%20brain%20hypoxia> [Accessed on Retrieved May 2022].
8. Sadeghnia A, Mohammadpoor S. The investigation of rate of birth asphyxia and its relationship with delivery mode at Shahid Beheshti Hospital of Isfahan during 2013, 2014, and 2015. *Int J Prev Med.* 2019;10:23. doi: 10.4103/ijpvm.IJPVM\_383\_16.
9. Acharya A, Swain B, Pradhan S, Jena PK, Mohakud NK, Swain A, et al. Clinico- biochemical correlation in birth asphyxia and its effects on outcome. *Cureus.* 2020;12(11):e11407. doi: 10.7759/cureus.11407.
10. Leuthner SR, Das UG. Low Apgar scores and the definition of birth asphyxia. *Pediatr Clin North Am.* 2004;51(3):737–745. doi: 10.1016/j.pcl.2004.01.016.