



# A Cross Sectional Study of Contributing Factors to Birth Asphyxia in Neonates of Allied Hospital, Faisalabad

Chanda Riaz\*, Sofia Arshad

Department of Neonatology, University of Hanley, Mumbai, India

## ABSTRACT

**Objective:** To determine the contributing factors to birth asphyxia in neonates in Allied hospital, Faisalabad.

**Methodology:** Cross sectional study was conducted in Allied hospital Faisalabad, all neonates of term without other physiological abnormalities were included. 50 cases were taken with their mother history of obstetric period and observational data were collected to assess the factors to birth asphyxia. Questionnaire was used as data collection tool. Data were analyzed through SPSS.

**Results:** Over-age, maternal diseases In pregnancy, multigravida, abortions, poor conduction method of delivery, home deliveries, mental stress, gestational hypertension and gestational diabetes, low hemoglobin level, low education level and no antenatal visits and short stature and cesarean sections are the contributing factors to birth asphyxia among neonates were traced in Allied hospital Faisalabad.

**Conclusion:** Majority of the risk factors associated to maternal history and miss-management of post-partum period, low education level, less awareness about miss-handled cases of birth and poor antenatal care and cesarean sections were the contributing factors of birth asphyxia.

**Keywords:** Perinatal asphyxia; Neonatal asphyxia; Gestational periods; Obstetric; Resuscitation

## INTRODUCTION

Neonatal asphyxia is a state of hypoxia in which lack of oxygen leads to ischemic changes in the tissues which creates disturbance in metabolic processes of neonates' body especially disturbing the chemicals that stimulate the brain cells causing damaging of nerve cells; as a result disturb the body functions. Persistent lack of oxygen damages the brain cells and increase the disease rate and death rate of neonates with asphyxia. Hypoxia damages the whole body organs, but to a great extent damaging is at the hypoxic ischemic encephalopathy, this is the major criteria of asphyxiated changes and leads to cerebral damages these changes affect the whole body functions to assess the treatable, dangerous and non-dangerous form of HIE the recommended cord blood test is done at early level. Normal pH of cord blood is 7.26-7.30. If pH is 7.10 it means neonate is at risk of developing ischemic changes but the range of pH less than 7.2 is treatable form of HIE and if the pH is less than 7 then it will be dangerous lead to

complications and even to death. Many ways are used to assess neonatal asphyxia, one in of them is the APGAR score in which best detection of respiratory disorders is point out. In APGAR score a check is made to activity, pulse, grimace, appearance and breathing in minimum 1 mint and maximum 5 min [1].

A study is published in 23 June 2015 by Olusegun Joseph Adebami done in Neonatology unit pediatric department and child health technology university of teaching hospital Nigeria southwestern. In this study author explained the cause and effect of oxygen lacking in newborns. He assessed all factors which create this situation of lacking oxygen known as neonatal hypoxia. This hypoxic condition leads to high morbidity and mortality rate in neonates. This is a fatal reality all over the world. He found that poor antenatal care, low socioeconomic status of pregnant ladies, illiteracy, lack of awareness about pregnancy, unavailability of educational programs in local areas

**Correspondence to:** Chanda Riaz, Department of Neonatology, University of Hanley, Mumbai, India; E-mail: chandariiaz420@gmail.com

**Received:** 23-Oct-2019, Manuscript No. JCRB-24-2557; **Editor assigned:** 28-Oct-2019, PreQC No. JCRB-24-2557 (PQ); **Reviewed:** 11-Nov-2019, QC No. JCRB-24-2557; **Revised:** 01-Aug-2024, Manuscript No. JCRB-24-2557 (R); **Published:** 29-Aug-2024, DOI: 10.35248/2155-9627.24.15.499

**Citation:** Riaz C, Arshad S (2024) A Cross Sectional Study of Contributing Factors to Birth Asphyxia in Neonates of Allied Hospital, Faisalabad. J Clin Res Bioeth. 15:499.

**Copyright:** © 2024 Riaz C, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

to pregnant ladies and those ladies who are taking guidelines from Dais. These factors are from the mother side. Other factors which also contribute to this condition are the mal-presentation, breech delivery and cord around the neck, shoulder dystocia, hand prolapse, oligohydramnios and stress conditions of mothers. In article he advocates that if health facilities for deliveries and the up-gradation of socioeconomic status will reduce the morbidity and mortality rate.

Maternal blood cells issues like extra red blood cells formation, cardiac issues like TOF, bypass and other vavular problems, intestinal problems, narrowing of lumens, poor hydration, risk of shock conditions, catheterizations, advanced disordered infections of mothers like inflammation of meninges, typhoid and many other multiple reasons leads to these ischemic conditions early in neonates soon after birth. Study shows that these complications move towards the neonatal stroke and mortality. As the prevalence of birth asphyxia increase, neurological disorders increase due to which cognitive problems arise in neonates. Well management and proper and timely diagnose can hold this problem early [2].

## MATERIALS AND METHODS

### Study design

Descriptive cross-sectional study design.

### Study area

Allied hospital Faisalabad was a site and neonatal unit no #1 was setting for this study.

### Duration of study

Study was carried out in 16 weeks (January 2019-April 2019).

### Data source

#### Search engines:

- Google Scholar
- PubMed
- Books

Then data was collected from the mothers of those neonates whose babies were suffering from the birth asphyxia in Allied hospital Faisalabad.

### Study population

Neonatal unit of Allied hospital Faisalabad.

### Sampling technique

A convenient sample of 50 people has been selected by direct observation for this study, convenient samples are inexpensive, accessible and usually less time consuming. This method is commonly used in health care setting.

### Sample size calculation

Sample size of this study was 30 [3].

### Sample recruitment

#### Inclusion criteria:

- All newly born babies from first day of life to 28 days of life at term delivered with weight range of 2 kg-3.5 kg admitted in NNU
- Mothers of reproductive age
- Term neonates with diagnosed asphyxia

#### Exclusion criteria:

- All neonates with cleft lip, cleft plat, spine bifida, low birth weight, IUGR (Intra Uterine Growth Restriction), premature babies, IDM (and with other structural abnormalities are excluded from this study.
- Anomalies cases diagnosed during pregnancy scanning.

### Data collection techniques

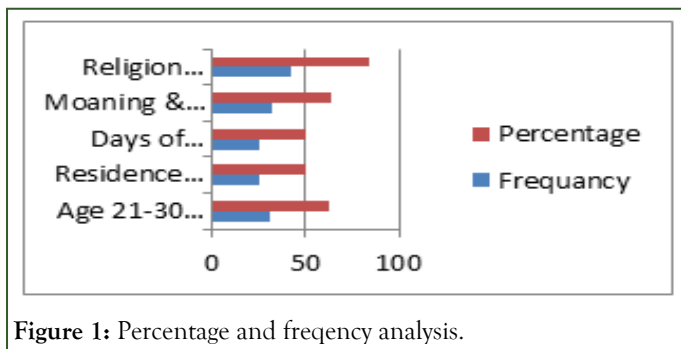
**Data collection tool:** Data collection tool used in this study was a quantitative structured questionnaire distributed to participants. This questionnaire was based on two categories [4]. Demographic questions, questions for knowing the contributing factors. It includes the participant's age, education, occupation, religion, knowledge about antenatal care visits and other relevant factors. After that the answers of questions noted and analyzed.

**Present or pilot study:** Pilot testing was done on 10% of sample size.

**Data analysis plan:** The data collected in this study was tabulated and analyzed by entering in Microsoft SPSS ver. 20 that was used for statistical analysis. Descriptive and inferential statistics were calculated.

## RESULTS

Table 1 shows the demographic data of the participants. 6 (12%) mothers of less than 20 year, 31 (62%) mothers are of 21-30 year and 13 (26%) mothers of 31-40 year. 25 (5%) participants are from locality and 24 (48%) participant are from out of city and 1 (2%) participants are foreigners. 6 (12%) participants have been admitted, 25 (50%) for more than 5 days and 18 (36%) for less than 5 days. 8 (16%) participants came with the complaint of moaning, 8 (16%) came with cyanosis, 32 (64%) came with moaning and cyanosis and 2 (4%) came with other complaints. Religion: 42 (84%) were muslims and 8 (16%) are christians (Figure 1) [5].



**Table 1:** Socio-demographic characteristic of the participant.

Variables	Frequency (n)	Percentage (n)%
<b>Age of the participant</b>		
Less than 20 year	6	12
21-30 year	31	62
31-40 year	13	26
More than 40		
<b>Residence of the participant</b>		
From the locality	25	50
Out of city	24	48
Foreigner	1	2
<b>Days of admission</b>		
5 days	6	12
More than 5 days	25	50
Less than 5 days	18	36
4	1	2
<b>Presenting complaint</b>		
Moaning	8	16
Cyanosis	8	16
All	32	64
Other	2	4
<b>Religion of the participant</b>		
Muslim	42	84
Christian	8	16

Table 2 shows the contributing factors to birth asphyxia which are related to obstetric history of mothers. 13 (26%) participants with diabetes mellitus, 9 (18%) and 28 (56%) participants were without any disease like hypertension and diabetes. 17 (34%)

participant were with the history of less than 2 abortion and 1 (2%) with the more than 2 abortion [6]. 14 (28%) participants have lost less than 2 babies. 22 (44%) participants were with the less birth spacing between past and present birth of one year, 14

(28%) of two years, 2 (4%) with three year and 8 (16%) participants with more than 3 years of gap. 25 (50%) were with one monthly antenatal visits and 7 (14%) with two monthly, 8 (16%) with more than three months and 10 (20%) were with no antenatal visits. 10 (20%) participant with no education and 35 (70%) with under metric. 32 (64%) mothers with less than 5 feet of height. 33 (66%) with low hemoglobin level in pregnancy. 15 (30%) with low blood pressure in pregnancy. 24 (48%) participants with stress during pregnancy. 5 (10%) were with obstructed labor, 13 (26%) with prolonged labor and 22 (44%) with ruptured membranes. 21 (42%) were with multiple pregnancy. 14 (28%) were handled by traditional birth attendants. 24 (48%) were delivered through long segment caesarian section (Figure 2) [7].

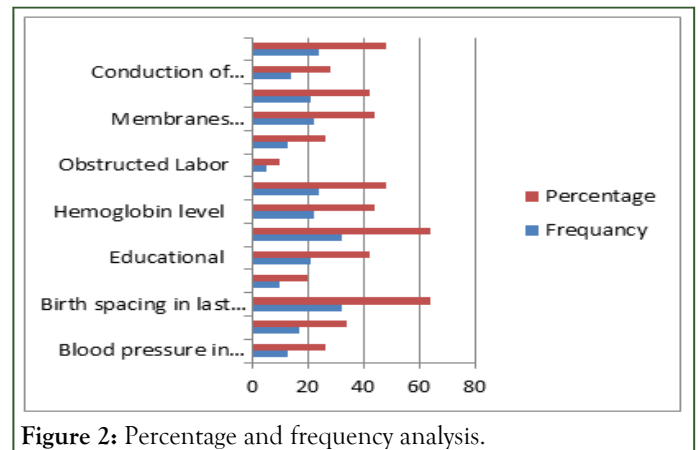


Figure 2: Percentage and frequency analysis.

Table 2: Average results of contributing factors to birth asphyxia relevant to obstetric history.

Variables	Frequency (n)	Percentage (n)
<b>Disease of mother</b>		
Blood pressure before	0	0
Diabetes before pregnancy	0	0
Blood pressure in pregnancy	13	26
Diabetes in pregnancy	9	18
None	28	56
<b>Number of alive babies before this</b>		
Less than 2 babies	16	32
More than 2babies	12	24
2 babies	10	20
None	12	24
<b>Sex of live babies</b>		
Male	9	18
Female	14	28
both	17	34
None	10	20
<b>Number of abortion</b>		
Less than 2	17	34
More than 2	1	2
None	32	64

<b>Number of dead babies before this</b>		
Less than 2	14	28
More than 2	0	
None	36	72
<b>Birth spacing in last and present pregnancy</b>		
One year	32	64
Two year	14	28
Three year	2	4
More than three	8	16
None	4	8
<b>Antenatal visits</b>		
One monthly	25	50
Two monthly	7	14
Three monthly	8	16
None	10	20
<b>Educational level of mother</b>		
None	10	20
Primary	11	22
Middle	10	20
Metric	14	28
Intermediate	0	
Graduation	5	10
Masters	0	
<b>Educational level of father</b>		
None	21	42
Primary	12	24
Middle	8	16
Metric	8	16
Intermediate	1	2
Graduation	0	

Masters	0	
<b>Height of mother</b>		
5 feet	4	8
Less than 5 feet	32	64
More than 5 feet	14	28
<b>Hemoglobin level during pregnancy</b>		
Less than 10 mg/dl	22	44
More than 10 mg/dl	17	34
10 mg/dl	11	22
<b>Blood pressure during pregnancy</b>		
Less than 90/50 mmHg	15	30
More than 90/50 mmHg	17	34
90/50 mmHg	18	36
<b>Mental stress during pregnancy</b>		
Yes	1	2
No	25	50
To some extent	24	48
<b>Type of family</b>		
Nuclear family	8	16
Joint family	42	84
<b>Size of family</b>		
Less than 4 members	6	12
More than 4 members	43	86
4 members	1	2
<b>Type of labor</b>		
Normal	10	20
Obstructed	5	10
Prolonged	13	26
Membranes ruptured	22	44
Other	0	
<b>Number of pregnancy</b>		

1 <sup>st</sup> pregnancy	10	20
2 <sup>nd</sup>	14	28
3 <sup>rd</sup>	5	10
Multi	21	42

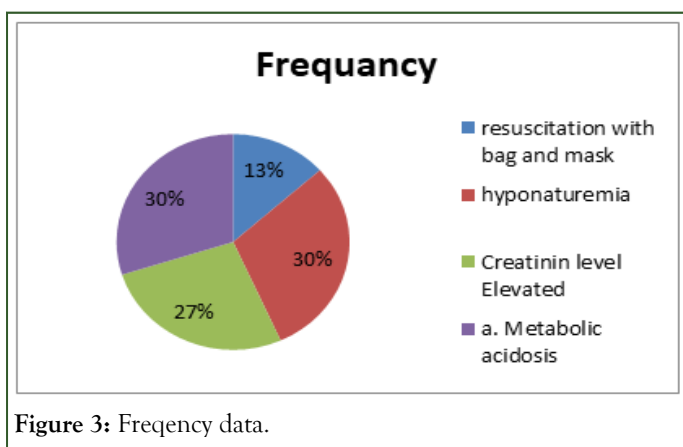
Table 3 shows the observational data of neonates admitted in nursery with the diagnose of birth asphyxia. 13 (26%) babies were resuscitated with poor management of bag and mask. 29 (58%) neonates were with low sodium level which were assessed by reports and clinical signs.

26 (52%) neonates with high level of creatinine. 49 (98%) neonates with disturbed ABGS, 29 (58%) neonates were with metabolic acidosis and 14 (28%) respiratory alkalosis (Figure 3) [8].

**Table 3:** Average results of observational data related to birth asphyxia in neonates.

<b>Method of resuscitation</b>		
Bag and mask resuscitation	13	26
Bag and mask resuscitation with pressure ventilation	9	18
Bag mask and chest compression with positive pressure ventilation	3	6
None	25	50
<b>Hypoxic ischemic encephalopathy staging</b>		
Mild	8	16
Moderate	28	56
Severe	14	28
<b>Clinical profile</b>		
Inotropic support	14	28
Respiratory support	31	62
Both	2	4
Anti-seizures	2	4
<b>Electrolytes report</b>		
Hyperkalemia with hyponatremia	29	58
Hypernatremia with hypokalemia	19	38
Hypocalcaemia	2	2
<b>Creatinin level</b>		
Normal range (0.4-1.2)	23	46
Elevated level	26	52

Low level	1	2
<b>Arterial blood gases</b>		
Metabolic acidosis	29	58
Metabolic alkalosis	3	6
Respiratory acidosis	3	6
Respiratory alkalosis	14	28
Normal	1	2
<b>APGAR scoring</b>		
5	0	
4	28	56
3	19	38
2	3	6
1	0	
0	0	



## DISCUSSION

Birth asphyxia is a medical term in which oxygen deprivation to brain cells occurs during birth process leads to physical harms. There are many contributing factors to birth asphyxia, in which unawareness, lack of education, miss-handling, miss-management of medical and paramedical staff, low antenatal visits, multiple pregnancy, low hemoglobin level during pregnancy, gestational diabetes, gestational hypertension, mental stress during pregnancy, obstructed labor, prolong labor, ruptured membranes, traditional birth attendants and cesarean section. Many investigations are done to diagnose and to know the extent of brain cells damage, but the most effective one is MRI. First essential step to take is oxygen supply in birth asphyxia. This study was done in Allied hospital Faisalabad to trace out the cause of so much high rate of birth asphyxia. This study has shown many contributing factors, in

which the most important one are known through a well-managed way. This study revealed that 8 (16%) cases of mild stage of birth asphyxia and 28 (56%) moderate and 8 (16%) are of severe stage cases. Another study was conducted in northern Tanzania in 2017, which revealed that 10% cases of stage one birth asphyxia, 68% were of second stage and 22% were of third stage birth asphyxia [9].

In present study 35% neonates were delivered by vaginal delivery and 65% babies were delivered by cesarean section. These data was collected from mothers of neonates. They were asked the multiple questions to find out the factors of birth asphyxia. This study showed that operational deliveries lead to more cases of birth asphyxia as compare to vaginal deliveries. Many happenings would be happened during deliveries, like miss-handling and miss-management of delivery cases. A study was conducted in Oromia region, southern Euthopia by Debero Mere T, et al in which it is briefed that 82.6% were delivered through cesarean section and 17.4% delivered vaginally. The reasons of operational deliveries were footling breech presentation 26%, unsuccessful progress to vaginal delivery was 11%, elective cesarean section 22% fetal slow movement 18% and 8% with short pelvis, 8% cord compression and 18% ruptured membranes [10].

## CONCLUSION

Operative deliveries are major factors to birth asphyxia, during those procedures miss-management and miss-handled cases mostly suffer from these sufferings like birth asphyxia. Untrained persons and local attendants case these factors which



lead to birth asphyxia. In these study 48% pregnant ladies are delivered by cesarean sections whose babies suffer from this case of birth asphyxia. In another study which was done by Teixeira Gracim cost, et al. in 2016 in Fedral university Jennairia, this study showed the risk factors of mortality in neonates, among them many factors were discussed, one of them is birth asphyxia, which was caused by many maternal factors like aged mothers, twin pregnancy and cesarean sections. In that study the percentage of cesarean sections was 42%.

## ETHICAL CONSIDERATION

Informed consent form consists of the following. i) Purpose of study, ii) Right to participate, iii) Permission to use their given data in research study. All participants are cleared about the type and reason of this research study before data collection. All participants were briefed about confidentiality of their provided.

## REFERENCES

1. Joseph S, Bindusha S, Radhika S, Krishnan R, Kumar S. Clinical profile and short-term outcome of perinatally asphyxiated term neonates in a tertiary hospital in southern Kerala. *Indian J Child Health*. 2017;4(3):399-404.
2. Gebreheat G, Tsegay T, Kiros D, Teame H, Etsay N, Welu G, et al. Prevalence and associated factors of perinatal asphyxia among neonates in general hospitals of Tigray, Ethiopia, 2018. *Biomed Res Int*. 2018;2018(1):5351010.
3. Halder S, Hoque MM, Rahman U, Sonia SF, Biswas SS. Acute kidney injury in sick neonate: Incidence and outcome. *J Bangladesh Coll Phys Surg*. 2017;35(1):20-23.
4. Thakur J, Bhatta NK, Singh RR, Poudel P, Lamsal M, Shakya A. Prevalence of electrolyte disturbances in perinatal asphyxia: A prospective study. *Ital J Pediatr*. 2018;44:1-6.
5. Bagla J, Garg H, Gulati RK, Gupta PP. Clinicoetiology profile of neonatal seizures in tertiary care level II neonatal intensive care unit. *Indian J Child Health*. 2017;4(3):383-386.
6. Bruckmann EK, Velaphi S. Intrapartum asphyxia and hypoxic ischaemic encephalopathy in a public hospital: Incidence and predictors of poor outcome. *South Africa Med J*. 2015;105(4):298-303.
7. Chettri S, Adhisivam B, Bhat BV. Endotracheal suction for nonvigorous neonates born through meconium stained amniotic fluid: a randomized controlled trial. *J Pediatr*. 2015;166(5):1208-1213.
8. Gurubacharya SM, Rajbhandari S, Gurung R, Rai A, Mishra M, Sharma KR, et al. Risk factors and outcome of neonates born through meconium stained amniotic fluid in a tertiary hospital of Nepal. *J Nepal Paediatr Soci*. 2015;35(1).
9. Li C, Miao JK, Xu Y, Hua YY, Ma Q, Zhou LL, et al. Prenatal, perinatal and neonatal risk factors for perinatal arterial ischaemic stroke: A systematic review and meta-analysis. *Eur J Neurol*. 2017;24(8):1006-1015.
10. Zammit C, Muscat R, Sani G, Pomara C, Valentino M. Cerebral white matter injuries following a hypoxic/ischemic insult during the perinatal period: Pathophysiology, prognostic factors and future strategy of treatment approach. A minireview. *Curr Pharm Des*. 2015;21(11):1418-1425.