

EFFECT OF MODE OF DELIVERY ON MECONIUM ASPIRATION SYNDROME IN NEW BORN INFANTS.

Sana Khalid¹, M, Omer Aslam², Nighat Aslam³

Abstract: Objective: The study was aimed to determine the frequency of the factors leading to meconium aspiration syndrome in neonates presenting in a tertiary care setting and to determine the outcome of meconium aspiration syndrome during hospital stay. **Study Design:** Descriptive case series study. **Setting:** This study was carried out in Neonatal Unit of the Department of Pediatric Medicine, Allied Hospital, Faisalabad. **Subjects And Methods;** Total number of 245 patients admitted fulfilling the inclusion criteria were selected. Information regarding factors leading to meconium aspiration syndrome like post maturity and cesarean section were obtained by history that was by asking date of last menstrual period and mode of delivery. FGR information was obtained by taking and plotting weight, length and head circumference of neonates on percentile chart. **Results:** In the distribution of patients by sex, there were 135 (55%) male and 110 (45%) female patients. There were 95 (38.89%) patients, who delivered with cesarean section, 108 (44.44%) patients had post maturity and 22 (8.33%) patients had GR. There were 17 (7.2%) patients had pneumothorax and mortality was recorded in 10 (4.4%) patients. **Conclusion:** It is concluded from this study that mode of delivery by cesarean section, post maturity and FGR are important risk factors which are frequently associated with meconium aspiration syndrome. Regarding outcome, patients with meconium aspiration syndrome are likely to have pneumothorax and mortality in large numbers during hospital stay.

Key words: Meconium aspiration syndrome, frequency, factors, cesarean section, FGR, post maturity, mortality.

Introduction;

Meconium aspiration syndrome (MAS) also known as neonatal aspiration of meconium is a medical condition affecting newborn infants. It occurs when meconium is present in the lungs of neonates before or during delivery.^{1,14}

Meconium aspiration syndrome can be diagnosed in infants with meconium staining of amniotic fluid with respiratory distress at or shortly after birth. Radiographic findings are also positive in these infants.^{2, 10}

It has been studied that the incidence of meconium stained liquor is more in prolonged pregnancies. It is 19% at 40 weeks of gestational age and 42% at 42 weeks of gestational age.³

The factors that are associated with meconium aspiration syndrome has been studied that, cesarean section associated with 41.8%, intrauterine growth restriction (FGR) in 6% of cases. While complications associated with meconium aspiration syndrome include pneumothorax in 9.6% of cases and mortality occur in 6.6% of cases.^{4,13}

Neonates with diagnosed meconium

Article Citation: Khalid S, Aslam O, Aslam N, Effect of mode of delivery on meconium aspiration syndrome in new born infants.. Indep Rev Oct-Dec 2017;19(10-12): 193-198.

1. Dr Sana Khalid. MBBS Medical Officer Mian Trust Hospital Faisalabad
2. M, Dr Omer Aslam. MBBS. Medical Officer Mian Trust Hospital Faisalabad
3. Dr Nighat Aslam. PHD Associate professor
Department of Biochemistry IMC, Faisalabad

Date received: 13/06/2017

Date Accepted: 22/02/2018

Correspondence Address:

Dr Sana Khalid

MBBS

Medical Officer

Mian Trust Hospital Faisalabad

aspiration syndrome represent a high-risk population with significant morbidity. These neonates also require intensive therapies.^{5,11}

The results of this study will bring awareness among mothers and obstetricians regarding factors leading to meconium aspiration syndrome like avoidance of post maturity in form of induction of labour at term pregnancy between 37 and 42 weeks, avoid unnecessary cesarean section without labour pain or cesarean section on request of mother at term pregnancy and plan for normal vaginal delivery and also FGR was controlled in form of treating maternal infection and maternal malnutrition. So, the better outcome was achieved.

MATERIAL AND METHODS

SETTING

This study was carried out in Neonatal Unit of the Department of Pediatric Medicine, Allied Hospital, Faisalabad.

STUDY DESIGN

Descriptive case series study

SAMPLE SIZE

Confidence level, 95% was calculated with sample size of 245 cases. 3.5% margin of error and taking expected percentage of FGR i.e. (factor leading to meconium aspiration syndrome) i.e. 6% (least among all) in neonates presenting in a tertiary care hospital.

SAMPLING TECHNIQUE

Non-probability consecutive sampling

INCLUSION CRITERIA

1. Neonates born after completing 37 weeks or more than 37 weeks of gestation calculated from date of last menstrual period.
2. Neonates referred to Neonatology Unit because of meconium aspiration

syndrome (as per operational definition).

EXCLUSION CRITERIA

Sick new born with other co morbid conditions like neonatal sepsis, birth asphyxia and syndromes. Neonatal sepsis is labeled in presence of fever (>98.6°F) blood and urine culture growth of organisms and raised C-reactive protein (>6gm/l). Birth asphyxia is labeled in presence of Apgar score of 3 or less prolonged for more than 5 minutes mostly at 15 and 20 minutes after birth along with respiratory distress. While syndromes is determined with presence of dysmorphic facial features.

DATA COLLECTION PROCEDURE

Total number of 245 patients admitted in the Neonatal Unit, Department of Pediatrics, Allied Hospital, Faisalabad, fulfilled the inclusion criteria were included in the study. After taking informed consent of parents, their biodata including name, date of birth, sex, address and date of admission were recorded. There will be no ethical issue regarding privacy and safety of the patients. Ethical approval certificate issued by hospital where study was conducted. Information regarding factors leading to meconium aspiration syndrome like post maturity and cesarean section were obtained by history that was by asking date of last menstrual period and mode of delivery. FGR information was obtained by taking and plotting weight, length and head circumference of neonates on percentile chart. Outcome was determined in terms of development of pneumothorax and mortality in neonates during hospital stay. Pneumothorax was diagnosed with hyperlucent shadow that was more dark shadow with no lung marking on chest x-ray. Mortality was defined as death during hospital stay associated with meconium aspiration syndrome. Data collected by researcher himself. All this information was collected through a Performa.

STATISTICAL ANALYSIS

All the information was entered in SPSS version 11 and analyzed. The qualitative variables like gender, factors leading to meconium aspiration syndrome (i.e. post maturity, cesarean section and FGR) and outcome (pneumothorax and mortality) were presented in the form of frequency and percentages

RESULTS

In the distribution of patients by sex, there were 135 (55%) male and 110 (45%) female patients (Table 1). The mean weight of the patients was 3.0 ± 0.4 kg. There were 9 (3.9%) patients in the weight range of up to 2.0 kg, 129 (52.8%) patients in the weight range of 2.1-3.0 kg and 107 (43.3%) patients in the weight range of 3.1-4.0 kg (Table 2).

The mean length of the patients was 49.2 ± 2.3 cm. There were 9 (3.9%) patients had length range of 40-45 cm, 154 (62.8%) patients in the length range of 46-50 cm and 82 (33.3%) patients in the length range of 51-55 cm (Table 3).

The mean head circumference of the patients was 35.0 ± 0.9 cm. There were 179 (73.3%) patients in the head circumference range of 31-35 cm and 66 (26.7%) patients in the head circumference range of 36-40 cm (Table 4).

In the distribution of patient's mode of delivery by cesarean section, there were 95 (38.89%) patients, who delivered with cesarean section and 150 (61.11%) patients who were not delivered with cesareans section (Table 5).

In the distribution of patients by post maturity, there were 108 (44.44%) patients had post maturity and 137 (55.56%) patients had not post maturity (Table 6).

In the distribution of patients by FGR, there

were 22 (8.83%) patients had FGR and 223 (91.17%) patients had not FGR (Table 7).

In the distribution of patients by pneumothorax, there were 23 (9.6%) patients had pneumothorax and 222 (90.4%) patients had not post pneumothorax (Table 8).

In the distribution of patients by mortality, there were 16 (6.6%) patients had mortality and 229 (93.4%) patients had not mortality (Table 9).

Table 1: Distribution of patients by sex (n=245)

Sex	No. of patients	Percentage
Male	135	55
Female	110	45
Total	245	100.0
Key: n Number of patients		

Table 2: Distribution of patients by weight (n=245)

Weight (Kg)	No. of patients	Percentage
Upto 2.0	9	3.9
2.1-3.0	129	52.8
3.1-4.0	107	43.3
Mean \pm SD	3.0 \pm 0.4	
Key: n Number of patients SD Standard deviation		

Table 3: Distribution of patients by length (n=245)

Length (cm)	No. of patients	Percentage
40-45	9	3.9
46-50	154	62.8
51-55	82	33.3
Mean \pm SD	49.2 \pm 2.3	
Key: n Number of patients SD Standard deviation		

Table 4: Distribution of patients by head circumference (n=245)

Head circumference	No. of patients	Percentage
31-35	179	73.3
36-40	66	26.7
Mean±SD	35.0±0.9	
Key:		
n	Number of patients	
SD	Standard deviation	

Table 5: Distribution of patients by cesarean section (n=245)

Cesarean section	No. of patients	Percentage
Yes	95	38.89
No	150	61.11
Total	245	100.0
Key: n Number of patients		

Table 6: Distribution of patients by post maturity (n=245)

Post maturity	No. of patients	Percentage
Yes	108	44.44
No	137	55.56
Total	245	100.0
Key: n Number of patients		

Table 7: Distribution of patients by FGR (n=245)

FGR	No. of patients	Percentage
Yes	22	8.83
No	223	91.17
Total	245	100.0
Key: n Number of patients		

Table 8: Distribution of patients by pneumothorax (n=245)

Pneumothorax	No. of patients	Percentage
Yes	17	7.2
No	228	92.8
Total	245	100.0
Key: n Number of patients		

Table 9: Distribution of patients by mortality (n=245)

Mortality	No. of patients	Percentage
Yes	10	4.4
No	235	95.6
Total	245	100.0
Key: n Number of patients		

DISCUSSION

One in every 7 pregnancies ends with meconium-stained amniotic fluid and approximately 5% of these infants develop the meconium aspiration syndrome (MAS).

The risk of MAS increases after the 40th week of pregnancy. MAS is a severe disease of the (mainly) term neonate, characterized by respiratory distress, pulmonary inflammation, persistent pulmonary hypertension and chronic hypoxia.^{6,12}

Fetal distress during labor causes intestinal contractions, as well as relaxation of the anal sphincter, which allows meconium to pass into the amniotic fluid and contaminate the amniotic fluid. Amniotic fluid is normally clear, but becomes greenish if it is tinted with meconium.⁹ Maternal risk factors can include: preeclampsia, maternal hypertension, oligohydramnios, maternal infections, maternal drug use, placental insufficiency, and/or intrauterine growth restriction.⁷

In our study 38.89% infants were delivered with cesarean section. As compared with the study of Dargaville and Copneli⁴ 41.8% infants delivered with cesarean section, which is comparable with our study.

In our study post maturity was found in 44.44% patients. As compared with the study of Adhikari et al⁸ post maturity was found in 54% patients, which is comparable with our study.

In our study Fetal growth restriction (FGR) was found in 8.83% patients. As compared with the study of Dargaville and Copneli4 intrauterine growth restriction was found in 6% patients, which is comparable with our study.

In our study pneumothorax was found in 7.2% patients. As compared with the study of Dargaville and Copneli4 pneumothorax was found in 9.6% patients, which is comparable with our study.

In our study mortality was found in 4.4% patients. As compared with the study of Dargaville and Copneli4 mortality was found in 6.6% patients, which is comparable with our study. In another study conducted by Adhikari et al8 mortality was found in 14% patients.

On the above discussion, it is concluded that frequency of factors leading to meconium aspiration syndrome are greater in neonates¹⁴. The monitoring of labor was the most significant factor in the reduction of meconium aspiration syndrome¹⁵.

CONCLUSION

It is concluded from this study that presence of post maturity, cesarean section and FGR are important risk factors for causation of meconium aspiration syndrome. The pneumothorax (7.2%) and mortality (4.4%) are outcome variables for meconium aspiration syndrome during hospital stay. The monitoring of labor was the most significant factor in the reduction of meconium aspiration syndrome.

REFERENCES

1. Swarnam k, soraisham AS, Sivanandan S. Advances in the management of meconium aspiration

syndrome. *Int J pediatri*(internet).2012(cited2012) 2012(about7p). Available from: <http://www.hindawi.com/journals/ijpedi/2012/359571/>

2. Yeh TF. Core concepts: Meconium aspiration syndrome: pathogenesis and current management. *Neo Reviews* 2010;11:503-12.
3. Amjad N, Imran T, Ahmad AN. Fetomaternal outcome of pregnancy between 40 and 42 weeks. *J Professional Med* 2008;15:317-22.
4. Dargaville PA, Copneli B. The epidemiology of meconium aspiration syndrome. *Pediatrics* 2006;117:1712-21.
5. Singh BS, Clark RH, Powers RJ, Spitzer AR. Meconium aspiration syndrome remains a significant problem in the NICU. *J Perinatol* 2009;29:497-503.
6. Ierland YV and Beaufort AJ. Why does meconium cause meconium aspiration syndrome? Current concepts of MAS pathophysiology *Early Human Development*. 2009;85:617-620
7. Edmonds, Patricia. 2014. "An introduction to meconium Midwifery Today with International Widwife. (111): 32-3.
8. Adhikari M, Gouws E, Velaphi SC, Gwamanda P. Meconium aspiration syndrome: importance of the monitoring of labor. *J Perinatol* 1998;18:55-60.
9. Gooding CA, Gregory GA, Taber P, Wright RR. An experimental model for the study of meconium aspiration of the newborn. *Radiology* 1971;100:137-40.
10. Block MF, Kallenberger DA, Kern JD, Nepveux RD. In utero meconium aspiration by the baboon fetus. *Obstet Gynecol* 1981;57:37-40.
11. Panton L, Trotman H. Outcomes of neonates with meconium aspiration syndrome at the university hospital of the West Indies, Jamaica; A resource-Limited setting. 2017. 10.1055/s-0037-1603330.
12. Mikolka PI, Kopincova J, Losutova P, Cierny D, Calkovska A, Mokra D. Lung inflammatory and oxidative alterations after exogenous surfactant

- therapy fortified with budesonide in rabbit model of meconium aspiration syndrome. 2016. *Physiol Res* 5:S653-S662.
13. Chettri S, Bhat BV, Adhisivam B. Current Concepts in the Management of Meconium Aspiration Syndrome. 2016 *Indian J Pediatr.*;83(10):1125-30.
14. Kelly LE1, Shivananda S, Murthy P, Srinivasjois R, Shah PS. Antibiotics for neonates born through meconium-stained amniotic fluid. 2017. *Cochrane Database Syst Rev.* 2017. 28;6:CD006183.
15. Natarajan CK, Sankar MJ, Jain K, Agarwal R, Paul VK. Surfactant therapy and antibiotics in neonates with meconium aspiration syndrome: a systematic review and meta-analysis. 2016. *J Perinatol.*36 Suppl 1:S49-54.