

# Determination of Meconium Stained Liquor among Fetal Distress Lead Cesarean Mothers

SYEDA TAHIRA SHERAZI<sup>1</sup>, SHAZIA BATOOL<sup>2</sup>, AMNA NOOR<sup>3</sup>, SANA JAVED<sup>4</sup>, AYESHA HUSSAIN SIAL<sup>5</sup>, MUHAMMAD KASHIF MUNIR<sup>6</sup>

<sup>1</sup>Senior Registrar, DHQ, Kasur.

<sup>2,3</sup>Consultant Gynecologist & Obstetrician, Shazia Zahid Medical Complex Lahore.

<sup>4</sup>Woman Medical Officer, DHQ, Attock.

<sup>5</sup>Woman Medical Officer, DHQ, Sheikhpura.

<sup>6</sup>Senior Research Officer, HRI-NIH TB Research Centre King Edward Medical University Lahore

Correspondence to Dr. Syeda Tahira Sherazi, Email: [drtahirasherazi@yahoo.com](mailto:drtahirasherazi@yahoo.com), Mobile: 03324649936

## ABSTRACT

**Aim:** To determine the frequency of meconium stained liquor in females undergoing cesarean section due to fetal distress.

**Study type, setting & duration:** This descriptive study was conducted at Unit III, Department of Obstetrics & Gynecology, Ganga Ram Hospital, Lahore during August 2018 to February 2019.

**Methodology:** The study was commenced on 240 females fulfilled selection criteria. After taking informed consent their demographic all females underwent cesarean section. During cesarean section, amniotic fluid was evaluated for meconium staining. All the information was recorded in pre-designed Performa. Data was entered and analyzed in SPSS.

**Results:** Mean age of females was 29.05±6.22 years, the mean gestational age was 39.48±1.09 weeks and mean BMI of patients was 26.45±4.70 kg/m<sup>2</sup>. There were 35 (14.6%) patients of parity 0, 72 (30%) had parity 1, 47 (19.6%) had parity 2, 46 (19.2%) had parity 3 and 40 (16.7%) had parity. The meconium stained liquor was present in 40 (16.7%) patients while absent in 200 (83.3%) patients. Practical implication of this study suggests that meconium stained liquor must be observed closely in females bearing a higher gestational age to avoid meconium aspiration syndrome among neonates.

**Conclusion:** Present study suggests a higher frequency of meconium stained liquor and a higher gestational age is associated with higher frequency of meconium stained liquor while no association of age, parity strata and BMI were found.

**Key words:** Cesarean section, pregnancy, trimester, parity, Meconium Aspiration Syndrome, Meconium Stained Liquor.

## INTRODUCTION

Meconium stained liquor or meconium stained amniotic fluid (MSAF) is a distressing indication of compromised foetus and linked to the poor neonatal outcomes. Incidence of MSAF ranged from 7% to 22%<sup>1</sup>. Meconium aspiration syndrome (MAS) on the other hand triggers in approximately 5% of MSAF patients. Effects of MAS include around 0.05% neonatal mortalities.<sup>2</sup> Unluckily Pakistan comprises the third position amongst top ten countries contributing two-third of global neonatal demises with an approximate rate of neonatal casualties as 49 per 1000 live parturitions<sup>3</sup>.

One of the features involved in around 27.3% neonatal casualties comprised at least history or proof of meconium passageway in the course of labour. However, meconium passageway is not communal afore 34 weeks of gestation whilst incidence gradually rises after this grey zone time<sup>4</sup>.

Meconium liquor staining or MSAF has been thought from long as a signal of neonatal distress and is traditionally considered as a sign of imperative labour till now.<sup>5</sup> Though the meticulous reason is yet to know, it is hypothesized that meconium runs through gastrointestinal tract of foetus because of the involuntary response to hypoxia.<sup>6</sup> Other documented aspects considering the passage of meconium consist mesenteric vasoconstriction persuaded hyper peristalsis of gut resulting in relaxation of anal sphincter, vagal stimulation, compression of umbilical cord and typical physiological role of completely mature foetus<sup>7</sup>.

Maternal factors comprise placental insufficiency, pre-eclampsia, maternal hypertension, maternal tobacco or drug addiction and oligohydramnios are also considered in meconium passage through uterine<sup>8,9</sup>. Neonates predisposed through MSAF are more sensitive for development of respiratory distress as compared to live births with clear fluid. Perinatal demises are presumed due to MSAF amongst the mothers comprise very low or even no risk of obstetric hitches<sup>4</sup>. High rates of caesarean deliveries, instrumental deliveries, low birth-weights, foetal distress, admission of neonates in intensive care units and neonatal mortalities are also associated with MSAF<sup>10</sup>.

Routinely females underwent cesarean section due to fetal distress, meconium staining is the most common problem. But literature showed variable evidence and reported the frequency of meconium staining very low than expectations. Moreover, there is no local evidence available in this regard. Therefore present study was conducted to get local evidence and implement the results of this study in local setting. Aim of this study was to determine the frequency of meconium stained liquor in females undergoing cesarean section due to fetal distress.

## METHODOLOGY

**Study Design:** Descriptive study.

**Study Settings:** Study was conducted at Unit III, Department of Obstetrics & Gynecology, Ganga Ram Hospital, Lahore during August 2018 to February 2019 after permission from hospital ethical committee.

**Sample Size** A total of 240 females is calculated with 95% confidence level, 3.5% margin of error and taking expected percentage of meconium stained liquor i.e. 8.2% in females undergoing cesarean section due to fetal distress.

**Inclusion and Exclusion Criteria:** All females aged 18-40 years, parity <5 presenting at gestational age >37 weeks (on LMP) undergoing cesarean section due to fetal distress were included in this study. All women having multiple pregnancy, breech presentation, IUGR (on ultrasound), Oligohydramnios or polyhydramnios, Females with chronic or gestational hypertension (BP ≥ 140/90 mmHg), diabetes (BSR > 186 mg/dl), abnormal LFTs (AST > 40 IU, ALT > 40 IU), RFTs (serum creatinine > 1.2 mg/dl), anemia (Hb < 10 g/dl), pelvic inflammatory diseases, ectopic pregnancy were excluded in this study.

**Data Collection Procedure:** A total of 240 females fulfilled selection criteria were enrolled in the study from operation theatre of Department of Obstetrics & Gynecology, Ganga Ram Hospital, Lahore. After taking informed consent their demographic profile i.e. name, age, gestational age, parity and BMI were noted. Then all females underwent cesarean section under spinal anesthesia by researcher herself. During cesarean section, amniotic fluid was evaluated for meconium staining<sup>11</sup>. If meconium present in liquor, then meconium stained liquor was labeled (as per operational

Received on 24-12-2022

Accepted on 15-05-2023

definition). All this information was recorded in pre-designed Performa.

**Statistical Analysis:** Data was entered and analyzed in SPSS. Mean±SD was calculated for quantitative variable like age, gestational age and BMI. Frequency and percentage was calculated for meconium stained liquor. Parity was presented as frequency. Data was stratified for age, parity, gestational age and BMI. Post-stratification, chi-square was applied for meconium stained liquor. P-value ≤0.05 considered as significant.

**RESULTS**

The mean age of patients was 29.05±6.22years, the mean gestational age was 39.48±1.09 weeks and mean BMI of patients was 26.45±4.70kg/m2. As depicted in Table 1. There were 35(14.6%) patients of parity 0, 72(30%) had parity 1, 47(19.6%) had parity 2, 46 (19.2%) had parity 3 and 40(16.7%) had parity as presented in Figure II. The meconium stained liquor was present in 40(16.7%) patients while absent in 200(83.3%) patients as presented in Figure II.

Table 1: Description of Age, Gestational Age and BMI

Variable	Age	Gestational Age	BMI
Mean	29.05	39.48	26.45
SD	6.22	1.09	4.70
Minimum	18	38	18.50
Maximum	40	41	34.93

Figure I: Distribution of parity

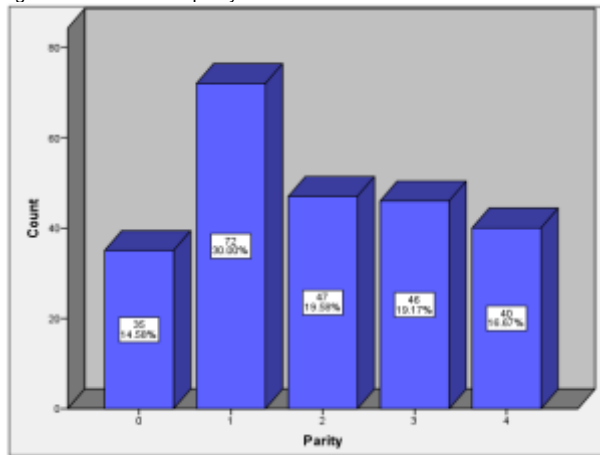
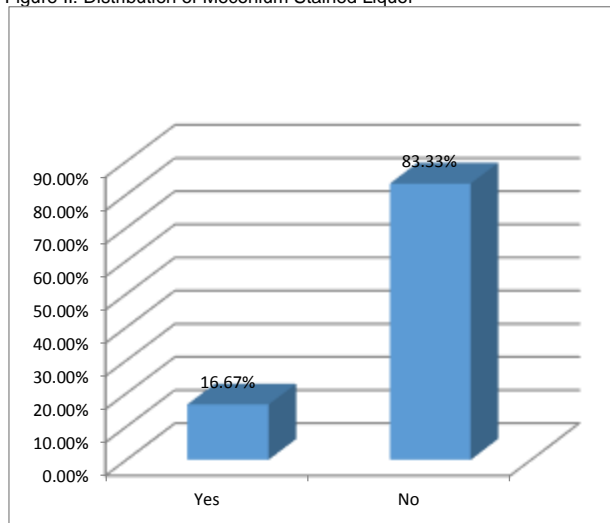


Figure II: Distribution of Meconium Stained Liquor



Data was stratified for age, gestational age, parity and BMI of patients. In patients aged 18-29 years and 30-40 years, the meconium stained liquor showed insignificant (p>0.05) difference. In patients delivered during 38-39 weeks and 40-41weeks were compared and the difference was significant (p<0.05).In primigravida patients and multiparous patients, the difference was insignificant (p>0.05).In patients with normal BMI, overweight patients and obese patients, the meconium stained liquor showed insignificant (p>0.05) difference as shown in Table 2.

Table 2: Stratification of Meconium Stained Liquor with Confounding Factors

Variable	Meconium Stained Liquor		p-value
	Yes	No	
Age (Years)	18-29	23(16.8)	0.973
	30-40	17(16.5)	
Gestational Age (weeks)	38-39	7(5.7)	0.000
	40-42	22(28.0)	
Parity Strata	Primigravida	3(8.6)	0.164
	Multiparous	37(18.0)	
BMI	Normal	14(14.1)	0.299
	Overweight	11(14.7)	
	Obese	15(22.7)	

**DISCUSSION**

Troublesome situation occurs due to MSAF for both of pediatrician as well as obstetrician. Since the situation is reportedly to be associated with exaggerated amounts of maternal operations, neonatal morbidity and mortality. The rated of MSAF are however variable in studies whilst in the range of 12-20%.<sup>12</sup>Presently the meconium stained liquor was present in 40 (16.7%) mothers while absent in 200 (83.3%) mothers and in agreement with above statement. A recent study with larger sample size of 1898 maternal cases presented a lower rate of meconium stained cases as 7.85% only and not in agreement to the present findings. Out of which MAS was present among only 12% of neonates<sup>13</sup>.

Various factors affect the incidence of MSAF including higher gestational age<sup>13</sup> as is the case in present study where none of the case was below the gestational age of 38 weeks. Similar kind of findings were presented by Desai et al also<sup>12</sup>. In another recent study a higher rates of meconium stained mothers as 67.47% was reported. Similarly mean Gestational age was reported be 40±1.084 weeks, primigravida as 39.2%, multiparous as 60.8%, rate of spontaneous labour as 60%, induced labour as 39.5% and fetal distress as high as 64% of cesarean deliveries. Amongst meconium stained liquor cases 39.5% had grade 3, and 36.5% had grade 2 respectively<sup>14</sup>. Findings are in line with present study considering the similar factors with meconium stained liquor. A study from New Delhi also reported an incidence of meconium stained liquor as 10% of which 45% cases had thin while 55% had thick meconium stained liquor<sup>6</sup> though the findings are not in line with present findings.

A cohort study undertaken in Sharif Medical City Lahore considered the patients having <5 parity and <36 weeks of gestational age Mothers. Equal number of subjects were placed in Low Amniotic fluid Index and Normal Amniotic Fluid Index (AFI) groups. Study reported a high of 40% cases having MSL of which 58% were from low AFI group and 22% in Normal AFI group presenting a significant difference (p-value <0.05)<sup>15</sup>. Another study conducted the study to evaluate the perinatal outcomes and delivery method in women who have meconium-stained liquor during labour presented an average gestational age of 40.53±1.48 weeks. In this study, primiparous women were 30%, 56% were multiparous and 14% were grand multiparous. Consistently, the study reported that out of all study subjects 42.7%women were nulliparous, 37.3% were multiparous and 20% women had parity of more than five<sup>16</sup>.

Similarly a prospective study was undertaken in Civil Hospital Karachi observed the grades of MSL to compare the frequency of fetal outcomes. Results showed the grade MSL II was the commonest as 40%, grade I MSL remained 30% and grade III

also found to be 30%. Still birth was 2.0%, poor Apgar score was 24.7% and rate of NICU admission was 28%. Maternal age, parity and gestational age effects were statistically significant on grade of liquor ( $p < 0.05$ )<sup>17</sup>. Thus the results are not comparable to presenting findings as these factors had no significance in present study.

Stratification of data for age, gestational age, parity and BMI of patients was also analyzed to see the confounding factors. Only deliveries during 38-39 weeks of gestational age showed significant difference ( $p < 0.05$ ) as compared to the deliveries during 40-41 weeks of gestational age while rest of the factors had no significant difference in this study. A report suggested that meconium stained liquor and fetal distress were present in 30.4% pregnancies during gestational ages of 40-41 weeks while 45.5% of same in deliveries of more than 41 weeks showing direct proportion to higher gestational age<sup>18</sup>.

Findings thus support statements that occurrence of meconium in absence of fetal heart anomalies is usually not indicative of compromised foetus and does not certify the instantaneous delivery. Though following preliminary hypoxic episode starting meconium passage, successive repetitive episodes because of elongated labour or anomalous activity of uterine may originate severe asphyxia following acidosis among foetus. This kind of hypoxic events may be prevented through careful monitoring of labour and optimal care of neonate following birth.<sup>6</sup> A strong association of postdate pregnancies with higher frequency of meconium stained liquor has also been reported<sup>14</sup> but not studied in present study thus deficiency in this study and a future prospect.

Present study suggests a higher frequency of meconium stained liquor as compared to other studies. Similarly a higher gestational age is associated with higher frequency of meconium stained liquor while no association of age, parity strata and BMI were found.

**Funding:** This is a non-funded project.

**Conflict of Interest:** Authors have no conflict of interest.

**Author's Contribution:** All authors have significant contribution in this study. STS conceived the idea and designed the project, SB, AN collected the data, SB, SJ and AHS wrote the paper, SJ and AHS observed the clinical relevance of data, MKM and SJ revised the manuscript, STS and MKM did the data analysis.

## REFERENCES

- Jain PG, Sharma R, Bhargava M. Perinatal outcome of meconium stained liquor in pre-term, term and post-term pregnancy. *Indian J Obstet Gynecol Res.* 2017;4(2):146-50.
- Rokade J, Mule V, Solanke G. To study the perinatal outcome in meconium stained amniotic fluid. *Int J Sci Res Pub.* 2016;6(7):41-3.
- Jehan I, Harris H, Salat S, Zeb A, Mobeen N, Pasha O, et al. Neonatal mortality, risk factors and causes: A prospective population-based cohort study in urban Pakistan. *Bulletin of the World Health Organization.* 2009;87(2):130-8.
- Mundhra R, Agarwal M. Fetal outcome in meconium stained deliveries. *Journal of clinical and diagnostic research: JCDR.* 2013;7(12):2874.
- Chaudhary R, Belbase M, Shrestha DK, Karna BK, Pandey HP, Shah MGJ, et al. A journal of nepalgunj medical college. *A Journal of Nepalgunj Medical College.* 2020;18(2).
- Patra S, Shruthi S, Puri M, Nangia S, Trivedi S. Meconium stained liquor in labour and mode of delivery: A time for reappraisal. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology.* 2020;9(10):4016-21.
- Ouladsahebmadarek E, Hoseinian MH, Hamdi K, Ghojazadeh M. Perinatal outcome in relation to mode of delivery in meconium-stained neonates. *Pak J Med Sci.* 2012;28(1):13-6.
- Dereje T, Sharew T, Hunde L. Meconium stained amniotic fluid and associated factors among women who gave birth at term in Adama hospital medical college, Ethiopia. *Ethiopian Journal of Health Sciences.* 2023;33(2).
- Chehroudi C, Kim H, Wright TE, Collier AC. Dysregulation of inflammatory cytokines and inhibition of vegfa in the human umbilical cord are associated with negative pregnancy outcomes. *Placenta.* 2019;87:16-22.
- Rathoria R, Rathoria E, Bansal U, Mishra M, Jalote I, Shukla NK, et al. Study of risk factors and perinatal outcome in meconium stained deliveries from a district of Uttar Pradesh, India. *Int J Reprod Contracept Obstet Gynecol.* 2018;7(9):3605-9.
- Sharif N, Qasim A. Perinatal outcome in pregnant females at term having low amniotic fluid index. *The Professional Medical Journal.* 2021;28(09):1358-64.
- Desai DS, Maitra N, Patel P. Fetal heart rate patterns in patients with thick meconium staining of amniotic fluid and its association with perinatal outcome. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology.* 2017;6(3):1030-6.
- Mohammad N, Jamal T, Sohaila A, Ali SR. Meconium stained liquor and its neonatal outcome. *Pakistan journal of medical sciences.* 2018;34(6):1392.
- Mazhar T, Arif R, Jabeen S. Frequency of meconium stained liquor in patients with postdates pregnancy. *Journal of Medical Sciences.* 2021;29(02):93-7.
- MASOOD N, IMTIAZ S, AKRAM N. Association of meconium stained liquor with low amniotic fluid index in females presenting at term for antenatal check-up. *Age (Years).* 24(5.40):28.36-4.24.
- Kumari R, Srichand P, Devrajani BR, Shah SZA, Devrajani T, Bibi I, et al. Foetal outcome in patients with meconium-stained liquor. *JPMA.* 2012;62(474):474-6.
- Begum A, Jabbar S, Hajira AI, Kanwal S, Bozdar M. Frequency of grades of meconium-stained liquor and compare the frequency of fetal outcome according to grades of meconium-stained liquor. *Pakistan Journal of Medical & Health Sciences.* 2022;16(03):605-.
- Punya B, Mpa S. Study of post-dated and term pregnancy with fetomaternal outcome at rrmch. *Int J Obstet Gynaecol Res.* 2017;4(2):179-83.