

# Association of Meconium Stained liquor with Low Amniotic Fluid Index in females presenting at term for antenatal check-up

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## ABSTRACT

**Aim:** To determine association between low amniotic fluid index & meconium stained liquor in females at term.

**Study design:** Cohort study.

**Method:** Department of Obstetrics & Gynecology at Sharif Medical City Hospital Lahore from May 1<sup>st</sup> 2018 to October 31<sup>st</sup> 2018. During this study period pregnant women at term were divided in two groups after evaluation of AFI i.e. low AFI and normal AFI. All patients were followed-up till delivery. At delivery, meconium stained liquor was assessed. Relative Risk was calculated with RR>1 as significant.

**Results:** The mean age of the patients was 26.41±5.21 years, the mean gestational age of the patients was 38.92±1.22 weeks. MSL was found in 40% cases in this study. The RR showed that there is 2.64 times greater chance of MSL in Low AFI group as compared to normal AFI group i.e. RR=2.64 [95% CI: 1.487-4.675].

**Conclusion:** Results of our study concluded that there is more chance of meconium stained liquor in Low AFI as compared to Normal AFI in females at term.

**Keywords:** Association, Amniotic Fluid Index, Meconium Stained Liquor, Term Pregnancy, Relative Risk

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## INTRODUCTION

Amniotic fluid index (AFI), a semi-quantitative finding obtained on ultrasound indicating amount of amniotic fluid, it was first described in 1987 by Phelan et al. Many studies have revealed that there is an increased risk of intrapartum fetal distress in pregnant women with oligohydramnios, as diagnosed by ultrasound examination<sup>1</sup>. AFI of <5cm was associated with adverse pregnancy outcomes in the form of meconium stained liquor (MSL), induction of labour, cesarean section for fetal distress, low Apgar score and neonatal intensive care unit admissions<sup>2</sup>.

The term meconium is given to the foetal feces produced in utero in foetal bowel. About 69% of newborns pass meconium by 12 hours of their age in extrauterine life however few fetuses pass meconium in utero as well. Reported incidence of MSL is ranging from 1.5 to 18%<sup>3</sup>. MSL is associated with adverse outcome and is considered as bad predictor of foetal outcome<sup>4</sup>. The significance of meconium in amniotic fluid is a widely debated subject<sup>3</sup>. The detection of meconium stained amniotic fluid during labour often causes apprehension and anxiety in the mind of the health care provider as it is often considered an indicator of fetal distress<sup>5</sup>.

Rational of this study was to determine the association between low amniotic fluid index and meconium stained liquor in females presenting at term for antenatal check-up. It is known that low AFI is associated with many fetal and maternal complications. In routine, it has been observed that the MSL is common in females having reduced AFI. Evidence exists in literature too, but contradictions have also been observed which reported that MSL does not occur due to low AFI. So we planned to conduct this study to find whether there is association between low AFI and MSL. This would help to get local magnitude as there is no local evidence present and would also help to reduce burden and extent of MSL and prenatal mortality.

## MATERIAL AND METHODS

This Cohort study was carried out in Department of Obstetrics and Gynaecology at Sharif Medical City Hospital. A total of 100 patients at term of age 18 to 35 years and parity < 5 at gestational age > 36 weeks on ultrasound and antenatal record were included and divided into two groups, 50 with low AFI exposed group and 50 with normal AFI unexposed group from May 1<sup>st</sup> to October 31<sup>st</sup> 2018. The diagnosis of low AFI (<5cm) and normal AFI i.e., > 5cm was made on ultrasound and patients with multiple pregnancy, fetal mal-presentation or abnormality (on ultrasonography), hypertension, diabetes, asthma, or with cardiac problems were excluded.

Sampling technique was non probability, consecutive. Sample size of 100 patients; 50 patients in each group was calculated with 80% power of test, 5% level of significance and taking expected percentage of MSL i.e. 42% in females with AFI<5cm and 16% in females with AFI>5cm presenting at term for antenatal checkup<sup>7</sup>.

100 women fulfilling inclusion criteria were recruited in the study from the OPD of Department of Obstetrics & Gynecology, Sharif Medical City Hospital Lahore. Informed written consent was taken. Demographic data (name, age, gestational age, parity and contact no.) was recorded. Females were divided in two groups after evaluation of AFI i.e., low AFI (as per operational definition) and normal AFI. All patients were followed-up till delivery. At delivery, meconium stained liquor was assessed (fetus expelled its earliest stool inside uterus before delivery that can be detected as brown amniotic fluid during labor or individual clumps of meconium in the fluid). All the data was collected by using a predesigned proforma.

Data analysis was done by using SPSS version 20. Quantitative variables like age and gestational age was presented by calculating mean and standard deviation. Qualitative variables like MSL were calculated by frequency and percentage. Relative Risk was calculated to measure

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the association between MSL and low AFI. RR>1 was taken as significant.

**RESULTS**

The mean age of the patients in low AFI group was 24.46±5.40 years and in normal AFI group was 28.36±4.24 years. The mean gestational age in low AFI group was 38.78±1.25 weeks and in normal AFI group was 39.06±1.19 weeks. There were 36(36%) primiparous females, 26 had low AFI while 10 had normal AFI. There were 28(28%) females with parity one, 9 had low AFI while 19 had normal AFI. There were 24(24%) females with parity two, 10 had low AFI while 14 had normal AFI. There were 12(12%) females with parity three, 5 had low AFI while 7 had normal AFI (Table 1). The MSL was found in 40 (40%) cases (Fig 1).

The MSL was noted in 40 cases, out of which 29 were from low AFI (<5cm) group and 11 were from normal AFI (≥5cm) group. Similarly MSL was absent in 60 cases, out of which 21 were from low AFI group and 39 were from normal AFI group. The RR showed that there is four times greater chance of risk of disease in Low AFI group as compared to Normal AFI group i.e. RR=2.64 [95% CI: 1.487-4.675] (Table 2).

Table 1: Demographics of females

	Low AFI	Normal AFI
n	50	50
Age ( Years )	24.46±5.40	28.36±4.24
Gestational age (weeks)	38.78±1.25	39.06±1.19
Primigravida	26	10
Primiparous	9	19
Parity 2	10	14
Parity 3	5	7

Fig 1: Frequency distribution of MSL

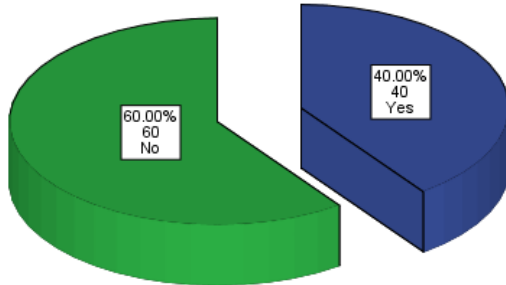


Table 2: Association of MSL with low AFI

Group	MSL		Total
	Yes	No	
Low AFI	29	21	50
Normal AFI	11	39	50
Total	40	60	100

RR=2.64 [95% CI; 1.487-4.675]

**DISCUSSION**

Meconium staining is an indicator of fetal distress and has its own complications in the newborn<sup>6,7,8,9</sup>. The American College of Obstetricians and Gynecologists states that AFI is more accurate and reproducible method of determining

abnormalities in amniotic fluid volume than other techniques<sup>10</sup>.

In the study the MSL was found in 40% of the patients in which 29 were from low AFI group and 11 were from normal AFI group, however MSL was not found in 60 patients in which 21 were from low AFI group and 39 were from normal AFI. The RR showed that there is four times greater chance of risk of disease in Low AFI group as compared to Normal AFI group i.e., RR=2.64 [95% CI; 1.487-4.675]. Some of the studies are discussed here supporting the findings of our study as.

In study by Aslam et al<sup>11</sup> demonstrated that the AFI is a reliable predictor of neonatal outcome. They showed that during the study period AFI was measured in 60 patients. Among these patients, 32 patients had AFI between 3-4 cm and babies were meconium stained, 23 patients had AFI of 5-6 cm and babies had normal APGAR at the time of delivery. AFI was < 2 cm in 5 patients and babies required resuscitation and admitted in nursery.

Al-Bayatti found that reduced AFI (<5cm) is associated with MSL i.e. the rate of MSL was 42% with low AFI whereas 16% with normal AFI (P=0.004) which showed that MSL was high in cases with low AFI<sup>12</sup>. Study by Jeng et al concluded that the AFI < 8 cm was associated with greater risk of meconium stained amniotic fluid, abnormal fetal heart rate monitoring, fetal distress and APGAR < 7 at 5 min<sup>13</sup>.

Another study by Rukhsana Karim et al<sup>2</sup> conducted in Peshawar from September 2004 to August 2005. They showed that the amniotic fluid index of <5cm was associated with adverse pregnancy outcomes in the form of meconium stained liquor, induction of labour, cesarean section for fetal distress, low Apgar score and neonatal intensive care unit admission.

In another study by Syria R et al<sup>14</sup> has reported a very high incidence of NICU admission. In their study 88.88% newborns were admitted in NICU in patients having AFI<5cm while in control group 52.8% newborns were admitted in NICU.

In study by Casey BM et al revealed 7% neonatal admissions in patients with AFI<5cm. While in control group only 2% newborns was admitted. They reported 5% neonatal deaths in patients having AFI<5cm while in control group incidence was 0.3%<sup>15</sup>. A study by K Sangeetha et al reveals that the association of meconium-stained amniotic fluid is high in women with AFI ≤5 cm. The thick meconium stained liquor was observed in 18% of the patients in the study<sup>16</sup>.

In study by SA Tasneem et al showed that thick meconium stained liquor was seen in 45% of oligohydramnios group, 14.2% in borderline group and 10.16% in normal group demonstrated<sup>17</sup>. On contrary in a study by Coolen et al., found that there is no association of MSL with low AFI i.e. the rate of MSL was 2.9% with low AFI (<5cm) whereas 3.1% with normal AFI (P=0.89) which showed that MSL was slightly high in cases with normal AFI<sup>18</sup>.

**CONCLUSION**

Results of the study concluded that there are more chances of meconium stained liquor in Low AFI as compared to Normal AFI in females at term.

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