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PERINATAL OUTCOME IN PREGNANCIES WITH MECONIUM STAINED AMNIOTIC FLUID: A PROSPECTIVE OBSERVATIONAL STUDY

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Abstract:

Introduction: Meconium-stained amniotic fluid MSAF) is observed in 12-16% of all deliveries and can indicate physiological maturation or fetal distress. Thick meconium is associated with adverse perinatal outcomes, including meconium aspiration syndrome MAS , respiratory distress, and increased neonatal morbidity.

Aim: To evaluate the clinical correlation of neonatal outcomes with MSAF, assess the mode of delivery, and analyze the relationship between meconium staining and fetal heart rate variability. ***Materials and Methods***: This prospective observational study was conducted over 18 months at a tertiary care hospital in Kolkata, India, involving 280 pregnancies with MSAF. Data on delivery mode, neonatal outcomes, and fetal heart rate variability were analyzed statistically.

Results: Spontaneous vaginal delivery was more common in cases of thin meconium 56.8% compared to thick meconium 32.4%; $p < 0.0001$. Neonates exposed to thick meconium had a significantly higher need for resuscitation 52.7% vs. 26.2%; $p < 0.0001$. Thick meconium was also associated with poor Apgar scores and increased NICU admissions.

Conclusion: Thick MSAF is a significant predictor of adverse neonatal outcomes, emphasizing

the need for vigilant monitoring during labor and timely interventions to improve perinatal outcomes.

Introduction:

Meconium-stained amniotic fluid (MSAF) is a common finding in term and post-term pregnancies, occurring in approximately 12-16% of deliveries [1]. Meconium passage in utero can result from physiological maturation or fetal distress due to acute or chronic hypoxia [2]. While thin meconium is often benign, thick meconium is associated with complications such as MAS, neonatal sepsis, respiratory distress syndrome, and increased NICU admissions [3]. The presence of MSAF necessitates vigilant fetal monitoring as it indicates potential fetal compromise. Continuous fetal heart rate monitoring is critical to detect abnormalities that may require timely obstetric interventions [4].

Materials and Methods:

This prospective observational descriptive study was conducted in the Department of Gynaecology and Obstetrics at Medical College, Kolkata, over a period of 18 months (February 2021 - August 2022). The study population consisted of pregnant women with singleton pregnancies, cephalic presentation, and meconium-stained amniotic fluid, admitted to the labor room. A sample size of 280 was calculated based on previous literature, considering a 10% non-response rate. Data on maternal demographics, mode of delivery (spontaneous vaginal delivery, instrumental delivery, or cesarean section), fetal heart rate patterns, and neonatal outcomes (Apgar scores, need for resuscitation, NICU admissions) were collected.

Results:

The results of the study revealed significant correlations between the presence of thick meconium and adverse neonatal outcomes. A statistically significant association was observed between parity and type of meconium ($p=0.0083$), with a higher proportion of patients with thick meconium having a parity of 2 or more. Additionally, the stage of labour at the time of detection of meconium was significantly associated with the type of meconium ($p=0.0402$), with a higher proportion of patients in the latent stage of labour having thick meconium. Furthermore, CTG abnormalities were more common in patients with thick meconium ($p<0.0001$), and the mode of delivery was also significantly associated with the type of meconium ($p<0.0001$), with a higher proportion of patients with thick meconium requiring instrumental or caesarean delivery. The need for resuscitation ($p<0.0001$), admission to SNCU ($p<0.0001$), and neonatal complications ($p<0.0001$) were also significantly higher in patients with thick meconium. Notably, neonatal death was significantly more common in patients with thick meconium ($p<0.0001$). The mean birth weight ($p=0.0011$), Apgar score at 1 minute ($p=0.0001$), and Apgar score at 5 minutes ($p=0.0001$) were significantly lower in patients with thick meconium compared to those with thin meconium. These findings suggest that the presence of thick meconium is a significant predictor

of adverse neonatal outcomes, emphasizing the need for close monitoring and prompt intervention in such cases.

Discussion:

The findings corroborate previous studies highlighting the association between thick MSAF and adverse perinatal outcomes [5, 6]. Thick meconium increases the risk of MAS due to airway obstruction, inflammation, and surfactant inactivation [7]. Early identification of MSAF through amniotomy and continuous fetal monitoring can guide timely interventions [8]. The study also underscores the importance of differentiating between thin and thick meconium to stratify risk levels effectively [9]. While thin meconium often represents physiologic maturation, thick meconium necessitates heightened vigilance due to its association with hypoxia-induced complications. Long-term outcomes following neonatal exposure to MSAF also warrant consideration, as studies have shown associations with respiratory and neurodevelopmental sequelae [10].

Conclusion:

Thick MSAF is a significant predictor of poor neonatal outcomes, including increased need for resuscitation, low Apgar scores, and NICU admissions. Continuous fetal monitoring and prompt obstetric interventions are essential

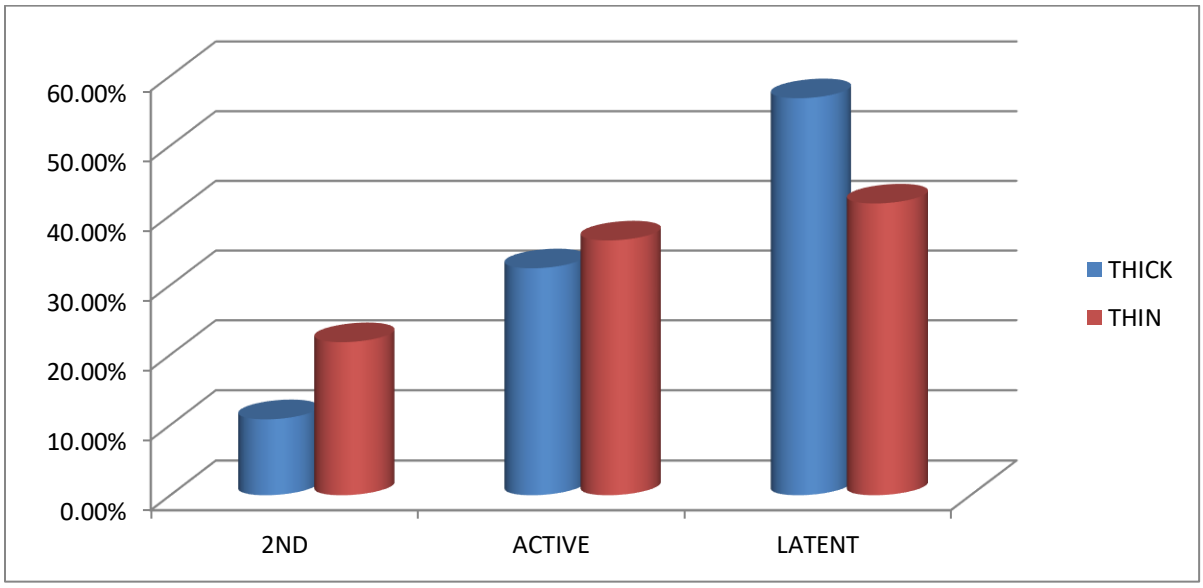
Table 1: Stage of labour at time of detection of meconium

Stage of labour at time of detection of meconium	Frequency	Percent
2nd	53	18.9%
Active	99	35.4%
Latent	128	45.7%
Total	280	100.0%

Table 2: CTG Abnormality

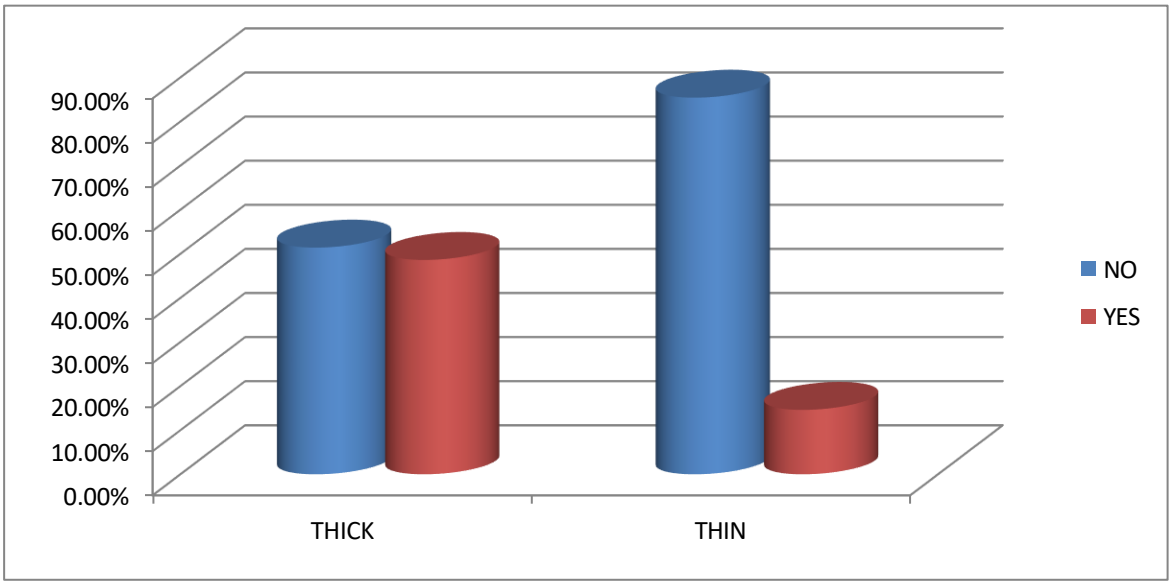
CTG Abnormality	Frequency	Percent
Normal	185	66.1%
Suspicious	23	8.2%
Pathological	72	25.7%
Total	280	100.0%

Figure: 1



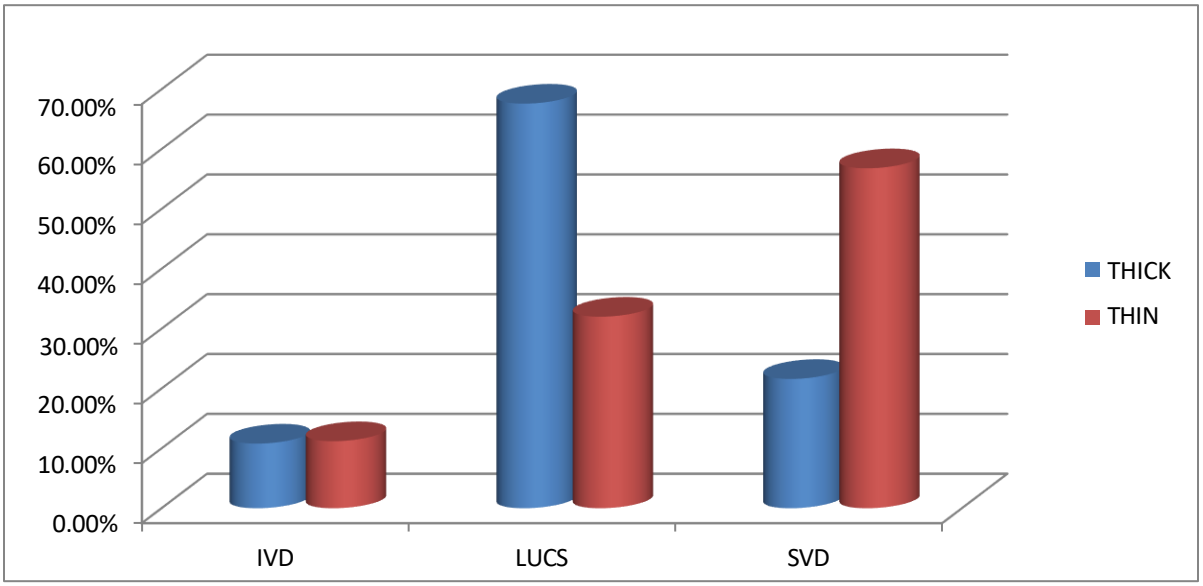
Association of Stage of Labour at Time of Detection of Meconium with Type of meconium was statistically significant (p=0. 0402).

Figure: 2



Association of neonatal complications with type of meconium was statistically significant (p<0.0001).

Figure 3



Association of neonatal complications with type of meconium was statistically significant (p<0.0001).

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