

# Meconium passage in utero and cardiac involvement in newborns

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**Summary:** We looked for clinical and electro-cardiographic evidence of cardiac involvement in 22 babies who passed thick meconium in utero. The babies were not asphyxiated at birth and had no evidence of meconium aspiration syndrome. Cardiac dysfunction was categorised as per Rowe's criteria (Rowe, 1979) with slight modifications. Accordingly, 9 babies had respiratory distress, 3 had respiratory distress with congestive cardiac failure and 2 had respiratory distress with shock. Oxygen dependence without respiratory distress was noted in 3 babies. In 8 babies an overlap of clinical categories was found and 5 were asymptomatic. Electrocardiographic evidence of myocardial ischemia of varying grades was seen in 19 babies including 5 asymptomatic babies. The centres where fetal distress is diagnosed only on intermittent auscultation, cardiac dysfunction should be anticipated in babies who have passed meconium in utero even if they are not asphyxiated at birth or have no evidence of meconium aspiration syndrome.

## Introduction

Meconium passage in utero is commonly associated with some degree of intrapartum asphyxia. The resultant hypoxemia can result in multisystem dysfunction especially when asphyxia is continued at birth and/or meconium is aspirated into lungs. The organs affected by asphyxia, in order of decreasing frequency are lungs, heart, brain, gut and kidneys. Dysfunction of other organs tends to be overlooked since pulmonary involvement is more obvious. This study was conducted to know the proportion and extent of cardiac involvement in babies who passed meconium in utero, but were not asphyxiated at birth and had no evidence of meconium aspiration syndrome on X-rays.

## Material and Methods

Twenty two consecutively born babies with history of thick meconium passage in utero, who were not asphyxiated at birth and whose chest x-rays showed no evidence of meconium aspiration syndrome, were the subjects of this study. The study was conducted at Cama and Albles Hospital, Mumbai between January and March 1996.

Rowe's classification (Rowe, 1979) was used for cardiovascular involvement in a modified form. The modified clinical categories included: respiratory distress alone, respiratory distress with congestive cardiac failure, respiratory distress with shock and oxygen dependence without respiratory distress. All babies except one had an electrocardiogram (ECG) done on day 1. ECG was

graded according to Rowe's Criteria (Rowe, 1979) into: grade I (equivocal), grade II (suggestive), grade III (moderate) and grade IV (severe).

## Observations

The frequency of cardiac dysfunction in different categories was, respiratory distress 9, respiratory distress with heart failure 3, respiratory distress with shock 2, oxygen dependence without respiratory distress 3, and asymptomatic 5. Overlap of different categories was observed as follows – respiratory distress with heart failure and oxygen dependence in 2, respiratory distress with shock and oxygen dependence in 1 and respiratory distress with oxygen dependence lasting well after respiratory distress had settled down in 5. ECG showed grade I changes in 2, grade II in 7, grade III in 11 and grade IV in 1. In one case, ECG was not possible. Two babies had normal ECG despite cardiac dysfunction, and 5 babies had abnormal electrocardiogram but no clinical evidence of cardiac dysfunction.

## Discussion

Miller et al (1975) performed continuous fetal heart rate monitoring and routine scalp blood sampling of 366 fetuses in labour; 106 of them were meconium stained. There was 3.5 times increase in incidence of Apgar score less than 7 at 5 minutes in meconium group. However, the incidence of fetal distress was not significantly different between meconium and non-meconium group as indicated by late decelerations and acidosis. This may mean that added stress of birth may have been responsible

for asphyxia at birth even though there was no asphyxia in utero.

It is tempting to suggest electronic fetal monitoring and detection of fetal acidosis for diagnosis of intrapartum asphyxia. Haverkamp et al (1979) studied the differential effects of intrapartum fetal monitoring on mothers and infants. They randomly assigned 690 high risk obstetric patients in labour to auscultation and electronic fetal monitoring with or without scalp pH determination. No difference was noticed in the outcome in terms of Apgar scores, cord blood gases, neonatal death, neonatal morbidity and nursery course. However, caesarean section rate was 18% in electronically monitored group as compared to 6% in auscultation group. Thus, availability of facilities for electronic monitoring and scalp pH determination may not enhance chances of detecting asphyxia at birth, well-known to be associated with cardiac dysfunction.

Out of 22 subjects of our study only 9 were diagnosed to have fetal distress on intermittent auscultation. Yet, 17 of them showed evidence of cardiac dysfunction apparently due to fetal asphyxia and added stress of birth. In 2 babies it assumed severe form i.e., cardiogenic shock. Three babies had oxygen dependence without respiratory

distress suggesting persistent pulmonary hypertension. These babies had intrauterine growth retardation and one of them had fetal distress in addition. Rowe's criteria (Rowe, 1979) for cardiovascular involvement were modified to include a category of oxygen dependence indicating pulmonary hypertension and to exclude rare forms like transient mitral regurgitation in apparently normal babies and respiratory distress in a neonate with cardiac malformation.

This study suggests that myocardial dysfunction commonly presenting as respiratory distress, should be anticipated in babies who pass meconium in utero, even if they are not asphyxiated at birth and have no evidence of meconium aspiration syndrome.

### References

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