

ABSTRACT

BACKGROUND AND OBJECTIVES

Perinatal asphyxia is a common neonatal problem at times devastating because of its potential for causing permanent damage and even death of the fetus or newborn infant. Only a third of deliveries in India are institutional and many asphyxiated babies are brought late to hospitals. In the absence of perinatal records, it is difficult to retrospectively diagnose perinatal asphyxia. There is a need to identify neonates with asphyxia who will be at high risk for hypoxic ischemic encephalopathy and multi-organ dysfunction.

The value of the present biochemical parameters used for diagnosing asphyxia is inadequate and controversial. The main objective of this study was to evaluate prospectively the value of measuring uric acid to creatinine (UA/Cr) ratio in early spot urine samples in diagnosing perinatal asphyxia, and to assess the relationship between the urinary uric acid to creatinine ratio and the severity of HIE.

METHODS

The study was performed from January 2016 to July 2016 in the Neonatal Intensive Care Unit of Rajah Mirasdar Hospital, Thanjavur. The

case group consisted of 50 asphyxiated full term neonates who fulfilled the inclusion and exclusion criteria. The control group consisted of 50 full term neonates with no signs of asphyxia after an uncomplicated pregnancy. The spot urine samples were collected within 6-24 hours of birth and sent for uric acid and creatinine analysis. Urinary uric acid to creatinine (UA/Cr) ratio value of >1.22 was taken as the cut-off level. Sensitivity, specificity, Positive predictive value (PPV), Negative predictive value (NPV) were calculated.

RESULTS

The Urinary UA/Cr ratios were found to be higher in asphyxiated infants (2.59 ± 1.04) when compared with those in the controls (0.72 ± 0.16 , $P<0.001$). UA/Cr ratios were significantly higher in infants with severe HIE (Stage 3) (4.29 ± 0.46) when compared with infants with moderate HIE (Stage 2) (2.79 ± 0.74) and those with mild HIE (Stage 1) (2.66 ± 0.70). A significant correlation was also detected between the UA/Cr ratio and the severity of HIE in the asphyxiated group. The cut-off value of UUA/Cr of >1.22 has a sensitivity of 86%, specificity of 92%, positive predictive value of 91.49%, negative predictive value of 86.49% and an accuracy of 89% in diagnosing asphyxia among term neonates.

INTERPRETATION AND CONCLUSION

The urinary uric acid/creatinine ratio was found to be a quick, inexpensive, non invasive, reliable, early biochemical marker of perinatal asphyxia.

KEY WORDS

Perinatal asphyxia, urinary uric acid/creatinine ratio, hypoxic ischemic encephalopathy (HIE).