

ABSTRACT

BACKGROUND:

Hypoglycaemia is one of the most common metabolic problems seen in neonatal intensive care unit. The symptoms of hypoglycaemia in neonates are subtle. There is increased risk of neuromotor disability and intellectual disability among the survivors of symptomatic hypoglycaemia¹.

Hence for early detection and treatment of hypoglycemia a reliable device is needed. In the laboratory, the blood glucose estimation is done using glucose oxidase method which is specific and precise for the estimation of glucose but the results are not immediately available. So glucose estimation is done using glucometer in the neonatal intensive care unit for immediate results.

Blood glucose estimated by glucometers correlates well with the laboratory values only in euglycemic and hyperglycemic states but it is less often useful in the hypoglycaemic range according to many studies².

AIMS AND OBJECTIVES

1. To estimate the blood glucose levels in sick newborn infants.
2. To estimate the validate of the glucometer for detection of blood glucose levels in detecting hypoglycaemia.

METHODS:

200 neonates admitted in NICU, GOVERNMENT RAJAH MIRASDAR HOSPITAL, Thanjavur Medical College, Thanjavur during a period of 6 months from January 2016 to July 2016. The glucose oxidase peroxidase method is done in the laboratory using venous sample. The blood glucose estimation was done by capillary and venous method using glucometer. Pearson correlation was used for statistical analysis. Hypoglycaemia is defined as the blood glucose level below 40mg/dl³. The glucose oxidase peroxidase method is the gold standard based on which the sensitivity, specificity, and predictive value was calculated.

RESULTS

In our study, of the 200 cases, 31 cases (15.5%) were hypoglycaemic, 164 (82%) cases were euglycemic and 5 cases (2.5%) were hyperglycemic by laboratory glucose oxidase peroxidase method, which is taken as the gold standard.

Capillary Blood glucose estimation using glucometer detected 23 cases (74.2%) of hypoglycaemia, 156 cases (95.1%) of euglycemia and 5 cases (100%) of hyperglycemia in comparison with laboratory glucose oxidase peroxidase method.

Venous blood glucose estimation using glucometer detected 29 cases (93.5%) of hypoglycaemic, 158 cases (96.3%) of euglycemia and 3 cases

(60%) of hyperglycemia in comparison with laboratory glucose oxidase peroxidase method.

Estimation of capillary blood glucose by glucometer was found to have a sensitivity of 74.19%, specificity of 98.2%, positive predictive value of 88.4% negative predictive value of 95.4% and accuracy of 94.5% with statistically significant P value < 0.05.

Estimation of venous blood glucose using glucometer was found to have a sensitivity of 93.55%, specificity of 98.23 %, positive predictive value of 90.62% negative predictive value of 98.8% and accuracy of 97.5% with statistically significant P value < 0.05.

CONCLUSION:

1. Estimation of blood glucose using capillary and venous blood using glucometer have strong correlation with laboratory oxidase peroxidase method in detecting neonatal hypoglycaemia
2. The sensitivity of detecting neonatal hypoglycemia by glucometer using venous blood is higher than capillary blood.

KEYWORDS

Hypoglycemia, neonates, glucometer, glucose oxidase method.