

The Role of Serum Fructosamine as a Monitoring Tool in Gestational Diabetes Mellitus Treatment in Vietnam

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Abstract : Introduction: In Vietnam, the current monitoring and treatment for ordinary diabetic patient mostly based on glucose monitoring with HbA1c test for every three months (recommended goal is HbA1c < 6.5%~7%). For diabetes in pregnant women or Gestational diabetes mellitus (GDM), glycemic control until the time of delivery is extremely important because it could reduce significantly medical implications for both the mother and the child. Besides, GDM requires continuous glucose monitoring at least every two weeks and therefore an alternative marker of glycemia for short-term control is considering a potential tool for the healthcare providers. There are published studies have indicated that the glycosylated serum protein is a better indicator than glycosylated hemoglobin in GDM monitoring. Based on the actual practice in Vietnam, this study was designed to evaluate the role of serum fructosamine as a monitoring tool in GDM treatment and its correlations with fasting blood glucose (G0), 2-hour postprandial glucose (G2) and glycosylated hemoglobin (HbA1c). Methods: A cohort study on pregnant women diagnosed with GDM by the 75-gram oral glucose tolerance test was conducted at Endocrinology Department, Cho Ray hospital, Vietnam from June 2014 to March 2015. Cho Ray hospital is the final destination for GDM patient in the southern of Vietnam, the study population has many sources from other provinces and therefore researchers believe that this demographic characteristic can help to provide the study result as a reflection for the whole area. In this study, diabetic patients received a continuous glucose monitoring method which consists of bi-weekly on-site visit every 2 weeks with glycosylated serum protein test, fasting blood glucose test and 2-hour postprandial glucose test; HbA1c test for every 3 months; and nutritious consultation for daily diet program. The subjects still received routine treatment at the hospital, with tight follow-up from their healthcare providers. Researchers recorded bi-weekly health conditions, serum fructosamine level and delivery outcome from the pregnant women, using Stata 13 programme for the analysis. Results: A total of 500 pregnant women was enrolled and follow-up in this study. Serum fructosamine level was found to have a light correlation with G0 ($r=0.3458$, $p < 0.001$) and HbA1c ($r=0.3544$, $p < 0.001$), and moderately correlated with G2 ($r=0.4379$, $p < 0.001$). During study timeline, the delivery outcome of 287 women were recorded with the average age of 38.5 ± 1.5 weeks, 9% of them have macrosomia, 2.8% have premature birth before week 35th and 9.8% have premature birth before week 37th; 64.8% of cesarean section and none of them have perinatal or neonatal mortality. The study provides a reference interval of serum fructosamine for GDM patient was 112.9 ± 20.7 $\mu\text{mol/dL}$. Conclusion: The present results suggests that serum fructosamine is as effective as HbA1c as a reflection of blood glucose control in GDM patient, with a positive result in delivery outcome (0% perinatal or neonatal mortality). The reference value of serum fructosamine measurement provided a potential monitoring utility in GDM treatment for hospitals in Vietnam. Healthcare providers in Cho Ray hospital is considering to conduct more studies to test this reference as a target value in their GDM treatment and monitoring.

Keywords : gestational diabetes mellitus, monitoring tool, serum fructosamine, Vietnam

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