Fructosamine as a Predictor of Diabetic Microvascular Disease in a Population With High Prevalence of Red Cell Disorders

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Aims: Fructosamine can be used to estimate glycaemia in individuals in whom HbA1c may be unreliable. We aimed to establish clinically useful fructosamine treatment targets in a population with a high prevalence of conditions affecting erythrocyte survival, including variant haemoglobin and G6PD deficiency.

Methods: Fructosamine was measured on a clinical basis in individuals in whom HbA1c was suspected to be unreliable by their primary physician. Study endpoints were incident retinopathy and albuminuria in individuals with Prediabetes (n = 60), Type 1 (n = 161) or Type 2 diabetes (n = 1350) during follow up of 4.4 ± 2.3 years.

Results: Fructosamine ≥ 250 umol/L was significantly associated with incident retinopathy, and fructosamine ≥ 300 umol/L with incident microalbuminuria, in univariate analysis and adjusted for established risk factors. Fructosamine ≥ 250 umol/L was also significantly associated with incident retinopathy in individuals with HbA1c < 7.0% (53 mmol/mol) at inclusion.

Conclusions: In this patient population, a single measurement of fructosamine significantly and independently predicts incident retinopathy in individuals with HbA1c < 7.0% (53 mmol/mol). Routine measurement of fructosamine on at least one occasion is recommended as part of assessment of prediabetes or diabetes mellitus in populations with a high prevalence of conditions affecting erythrocyte lifespan.

Keywords: Fructosamine; Haemoglobinopathy; Microvascular disease; Risk stratification.