Letters to the Editor

Artifactually lowered glycosylated hemoglobin (HbA1c %) in patient with diabetes on dapsone

Sir,

Glycosylated hemoglobin (HbA1c %) is a reliable test for assessment of glycemic control in diabetes but has limitations of its predictive value in some clinical situations. Exceptionally low HbA1c is estimated in various situations when RBC life span is shortened. We report a case of diabetic patient, who was on dapsone treatment for Hansen's diseases also and HbA1c values were inconsistently lower in comparison to self-monitored mean of blood glucose.

A 58-year-old male patient with Type 2 diabetes mellitus for the past 7 years was seen in endocrine unit. After taking oral hypoglycemic agents initially, he was on premixed insulin (30/70) twice a day for the past 7 months. He had history of treatment for Hansen's disease 12 years back. There was a relapse of leprosy with acid-fast bacilli positive from ear lobule, diagnosed 7 months back on account of progressive deformity in both hands. He was put on antileprotic therapy, which included dapsone, clofazimine, and rifampicin in the standard dosages. On follow-up, his plasma glucose values were higher or at upper limit of normal. There was no reported episode of hypoglycemia either biochemically or clinically. Despite off target glucose profile, his HbA1c was documented twice in low normal range: 3.9 and 4.2%. HbA1c was measured by high-performance liquid chromatography method (DS-5 Lilac Incorporation, USA). Routine investigations revealed hemoglobin of 8.8 g% with reticulocytosis, alanine transferase 45 U/L (10–40 U/L), blood urea 25 mg/dl, and serum lactic dehydrogenase 589 U/L (reference upto 450 U/L) with normal serum bilirubin. These results were suggestive of mild hemolysis. Glucose 6 phosphate dehydrogenase (G6PD) enzyme level was normal. Coomb's direct and indirect tests were negative. We did not find any other cause of hemolysis other than dapsone therapy.

Self-monitoring of blood glucose and HbA1c estimation are integral part for judging the adequacy of antidiabetic measures. HbA1c reflects the mean blood glucose of the past 3 months. Drugs,[1] hemoglobinopathies, and disease states like uremia and hemolytic disorder might shorten the average life span of red blood cell and thus spuriously lower values of HbA1c.

Tropical diseases like leprosy are still a problem in developing world. With ongoing increase in prevalence of diabetes, we often encounter combination of the two diseases. Dapsone (4,4'-diamineodiphenyl sulfone) is one of the primary drugs for treating leprosy. This drug is known to induce hemolysis in pharmacological dosage. It induces erythrocyte destruction by the formation of reactive oxygen species.[2] HbA1c lowering effect of dapsone has been reported in NOD mice.[3] Dapsone-induced hemolysis, with increased erythropoeisis, may result in decrease of HbA1c. In this case, evidence of clinical hemolysis was never observed, yet the biochemical and hematological parameters for ongoing hemolysis were present. This has artifactually lowered measured HbA1c. Ignorance of this fact might result in reduction of antidiabetic measures leading to deterioration of the glycemic control. In such situation, plasma fructosamine, a test yet to be standardized, has been suggested as a replacement to HbA1c as the former is not affected by hemolytic conditions.[4]

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