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Blood 142 (2023) 2301–2302

The 65th ASH Annual Meeting Abstracts

POSTER ABSTRACTS

901.HEALTH SERVICES AND QUALITY IMPROVEMENT - NON-MALIGNANT CONDITIONS

Are We Diagnosing and Managing Diabetes in Patients with Sickle Cell Disorders Accurately?

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Introduction: Patients with hemolytic anemias, especially those resulting from severe sickle cell disorders (SCD), may experience increased red blood cell (RBC) turnover, influencing hemoglobin (Hb) glycation rates. The American Diabetes Association (ADA) recommends measuring plasma glucose levels for diabetes mellitus (DM) diagnosis. However, to monitor glycemic control, fructosamine provides a valuable measure of glycated serum protein byproduct, independent of RBC lifespan. It is important to note that G6PD can aggravate anemia and its co-existence with SCDs is reported to vary between 7%-35.83% depending on genotype, ethnicity and location. Despite National Glycohemoglobin Standardization Program's (NSGP) reporting that most chemistry analyzers exhibit no assay interference, Lacy et al. showed that HbA1C systematically underestimated past glycemia in black patients with sickle cell trait. It is hypothesized that numerous SCD patients with DM receive diagnosis and management based on HbA1C. This study seeks to evaluate the management patterns and the correlation between Hb and HbA1C in the context of a hemoglobinopathy, aiming to enhance patient care standards.
Methods: We identified 61 adult sickle cell disorder patients who also had a diagnosis of type 2 DM or prediabetes between January 2019 and May 2023. Patients with acute blood loss events (with or without transfusions), iron deficiency, hyperbilirubinemia, liver or renal disease, HIV infection on antiretroviral therapy, and those receiving Vit A/C supplementation were excluded from the study, as these conditions are known to impact the HbA1C levels. HbA1C testing at our institution was formerly done using Siemens Dimension Vista 500/1500 analyzer until it was switched to Abbott Alinity-c in October 2022. According to NGSP, there are no reports of assay interference in patients with Sickle Cell Disease (SCD) for either of these chemistry analyzers. Descriptive statistics were utilized to report data as means and percentages. Pearson correlation coefficient was used to assess the relationship between Hb and HbA1C values.
Results: Mean age of the study participants was 52.59 years (SD 15.56) with a female predominance (53/61, 86.89%). All patients were of African American descent. The study included 49/61 (80.33%) patients with sickle cell trait, 3/61 (4.92%) with HbSC, 2/61 (3.28%) with HbSS, and 1/61 (1.64%) with HbS β+thal genotype. None of the patients had documented evidence of G6PD testing. Initially, all 61 patients had been diagnosed with DM or prediabetes via HbA1C. Only 3/61 (4.92%) patients had a fructosamine test documented in chart. The mean and median HbA1c values were 7.57% and 6.70% respectively (SD 2.07%). Among the participants, 53/61 (86.89%) patients were actively undergoing treatment for DM or prediabetes. There was a negative correlation ($r = -0.142$) between average Hb (at diagnosis) and HbA1C (at diagnosis) values ($p = 0.286$) (Figure 1).
Conclusions: None of the patients in our study had evidence of G6PD testing. All patients with SCD and DM or prediabetes were initially diagnosed and managed using HbA1C. Only 3/61 patients had documentation of a fructosamine test. In the context of SCD, there was a poor correlation between Hb and HbA1C. The HbA1C test can either overpredict or underpredict DM in SCD patients due to assay interference (Siemens DCA Vantage analyzer is known to overpredict and is commonly used for point-of-care testing in an office setting) or hemoglobinopathy, respectively. Marked discrepancies between plasma glucose levels and measured HbA1C should prompt alternate diagnostic testing. It is recommended to use fasting blood glucose or oral glucose tolerance test to diagnose DM and prediabetes in patients with SCD. The reported cost difference

between these tests is not significant. Fructosamine levels remain unaffected by hemoglobinopathies and can thus be used to monitor DM in patients with SCD.

Disclosures No relevant conflicts of interest to declare.

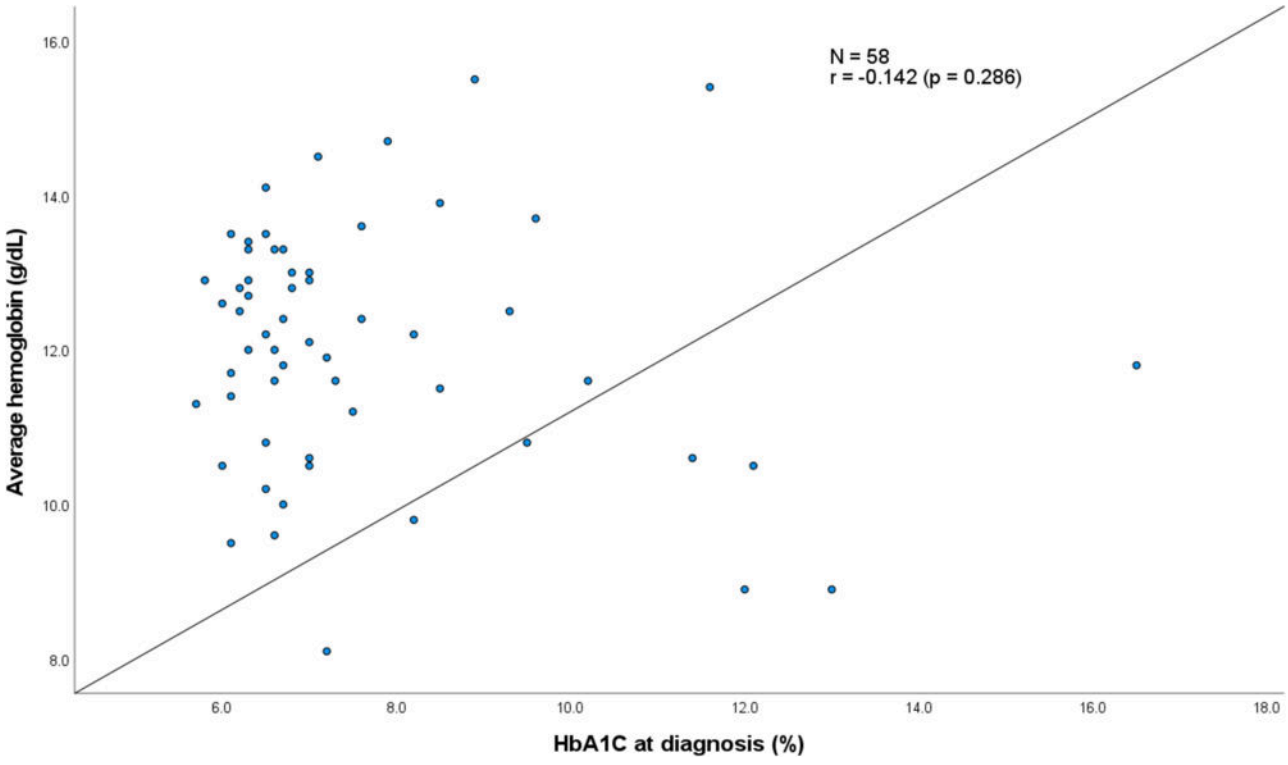

Figure 1

https://doi.org/10.1182/blood-2023-182540