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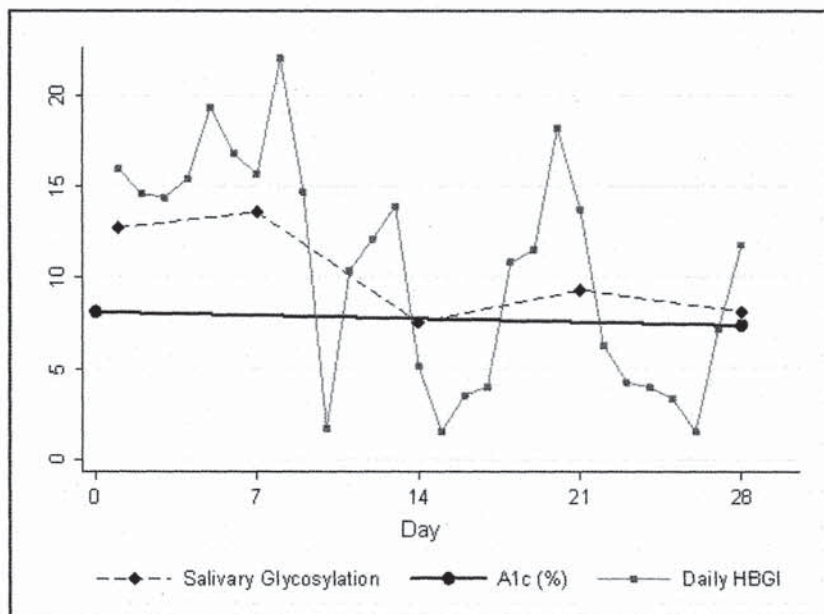
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Non-invasive salivary protein glycosylation as a short-term glycemic index

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Abstract:

The standard parameter for monitoring of glycemic index is hemoglobin A1c, which reflects average glycemia over the previous 3 months. Fructosamine and glycated albumin can provide potential assessment of more near-term glycemia, but all of these are invasive and require specific laboratory analysis. We evaluated salivary glycoprotein levels as a non-invasive alternative by comparing it to A1c and continuous glucose monitoring (CGM) in 8 type 1 and type 2 diabetics. Saliva was collected at days 1, 7, 14, 21 and 28 and blood collected at baseline and day 28. Salivary glycosylation was measured by lectin-binding immunoassays and was normalized for total protein concentration. To account for asymmetry in the blood glucose measurement scale and suppress normal fluctuation in the target range for glucose control, the High Blood Glucose Index (HBGI) was calculated to quantify glycemia from the CGM data. Daily, weekly, and 28-day HBGIs were computed and matched to the time of each study visit. The Figure shows weekly salivary glycosylation and daily HBGI over 28 days of CGM in a type 2 diabetic with beginning and ending A1c's of 8.1% and 7.4%, respectively. Six participants did not achieve optimal control as defined by baseline HbA1c's <7.0%. During CGM, these participants achieved a 33% reduction in HBGI. A1c only slightly changed over this time period ($-0.4 \pm 0.5\%$), and did not reflect the degree of glycemic variation observed. Average salivary glycosylation levels collected weekly over 4 weeks demonstrated a stronger correlation with CGM than A1c ($r=0.81$ vs. $r=0.52$) and represent a promising, non-invasive method for glycemia



monitoring.

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