TACSM Abstract

Coagulation Activation Pathway May Be Altered in Individuals Comorbid with HIV and Type 2 Diabetes

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ABSTRACT

The expected lifespan of persons living with human immunodeficiency virus (PLWH) has increased significantly due to improved treatment options. However, an unintended consequence has been an increased prevalence of chronic diseases such as type 2 diabetes mellitus (T2D). It is therefore important to explore the underlying biological mechanisms for this increased risk of T2D among PLWH since it is not yet well understood. Investigation of specific biomarkers could help define the pathogenesis of T2D in PLWH and yield many positive outcomes including the detection of 'at risk' individuals as targets of early interventional strategies along with identification of new diagnostic criteria. **PURPOSE:** The primary aim of this research was to identify specific biomarkers which differentiate PLWH and those comorbid with HIV and T2D (PLWH+T2D). **METHODS:** 16 PLWH (47.9±2.7 y/o; 10 male) and 16 clinically diagnosed PLWH+T2D (53.6±1.4 y/o; 10 male) were recruited for the study. Blood was drawn via venipuncture for assessment of HbA1c and biomarkers associated with inflammation (IL-1β, IL-6, hs-CRP, insulin, adiponectin, leptin, and TNF-α, along with soluble receptor counterparts sIL-1RI, sIL-1RII, sIL-6RI, sTNF-RI, and sTNF-RII), vascular function (ADAMTS13, slCAM-1, sVCAM-1, SAA, and, SAP), and coagulation activation (fibrinogen, D-dimer, and, vWF). **RESULTS:** As expected, HbA1c was lower in PLWH compared with PLWH+T2D (5.8±0.1 vs 7.0±0.4%, $p<0.05$). As further confirmation of a diabetes diagnosis, all individuals in the PLWH+T2D group were taking prescribed oral diabetes medication. Predictably, hs-CRP levels were elevated; however, not significantly different between groups (7.8±1.4 vs 11.0±2.8 mg/L, $p>0.05$). Differences were found between PLWH and PLWH+T2D in indicators of coagulation activation, specifically vWF (2.39±0.42 vs 3.88±0.55 mg/dL, $p<0.05$) and fibrinogen (1425±103.1 vs 1914±184.2 ng/mL, $p<0.05$). No significant differences between PLWH and PLWH+T2D were seen in any of the biomarkers associated with vascular function or inflammation. **CONCLUSION:** We believe this is the first time biomarkers of vascular function and coagulation activation have been assessed in this comorbid population. The significant increase in vWF and fibrinogen in PLWH+T2D compared with PLWH suggest that pathways involving coagulation may be the first ones altered in the transition to this co-morbid state.