Soluble ST2 is directly correlated with HbA1c in individuals with an average glycemia in the normal/prediabetes range

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Introduction

Suppressor of tumorigenicity 2 (ST2), a member of the toll-like/interleukin (IL)-1-receptor-like superfamily, exists in two isoforms with opposing biological activities. The transmembrane isoform (ST2L) confers the biological activities of its ligand IL-33, while the soluble isoform (sST2) serves as an antagonistic decoy receptor. The IL-33/ST2L axis is protective against obesity, insulin resistance, type 2 diabetes (T2D), atherosclerosis[1] and cardiac fibrosis. Elevated sST2 levels have been reported in patients with inflammatory disease, T2D[2], and cardiovascular disease (CVD)[3]. T2D and prolonged hyperglycaemia is associated with increased risk of CVD such as coronary heart disease. However, recent studies have reported that CVD, such as subclinical atherosclerosis and left ventricular systolic and diastolic dysfunction, can be detected in individuals with prediabetes[4]. This suggests that CVD may develop prior to or concomitantly with the onset of metabolic disease. Therefore, identification of early biomarkers that may be associated with the onset of subclinical cardiometabolic disease is of considerable importance. Since sST2 is elevated in both CVD and T2D, we hypothesized that sST2 may serve as a novel biomarker to detect subclinical CVD risk in the earliest stages of metabolic disease development.

Purpose

The purpose of this preliminary study was to determine whether sST2, which is elevated in CVD and/or T2D, is associated with glycated hemoglobin (HbA1c) in individuals with glycemia in the normal/prediabetes range.

Methods

Participant clinical profile and measurement of soluble ST2

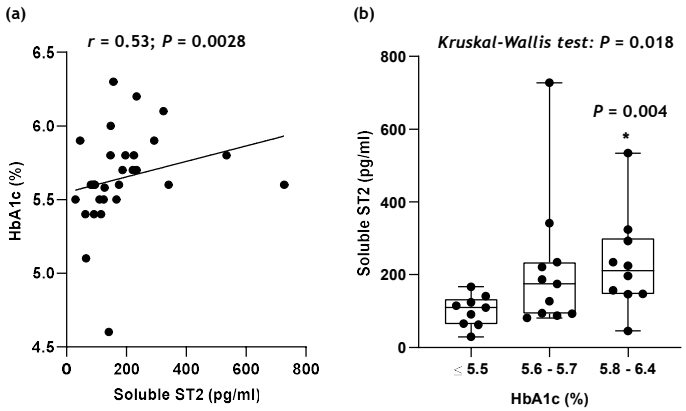
A total of 30 adults with HbA1c in the normal (<5.7%) and prediabetes (5.7-6.4%) range were enrolled, and written informed consents were obtained. The anthropometric and biochemical parameters were measured. The plasma levels of sST2 was measured using Enzyme-Linked Immunosorbent Assay kits.

Statistical analysis

Statistical analysis was conducted using the GraphPad Prism software. To compare between two groups of data, the non-parametric Mann-Whitney test was conducted. For correlation analysis, the non-parametric Spearman r test was applied. A *P*-value <0.05 was considered statistically significant.

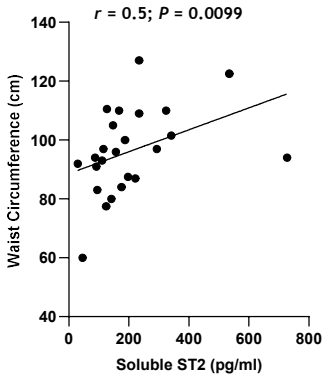
Results

Soluble ST2 and overall glycemia



(a) Soluble ST2 was directly correlated with HbA1c in individuals with glycemia in the normal/prediabetes range. **(b)** Individuals with higher HbA1c had significantly higher levels of sST2 compared to those with lower HbA1c.

Soluble ST2 and waist circumference



Soluble ST2 was directly correlated with waist circumference in individuals with glycemia in the normal/prediabetes range.

Conclusion

These data suggest that circulating sST2 increases with increasing HbA1c and waist circumference, and thus, may be used to establish a cut-off value for cardiometabolic risk/disease.

References

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