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Diabetes Attenuation of the Estrogen-Mediated Increase in Endothelial Function is Associated with Circulating SIRT1

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ABSTRACT

Cardiovascular disease (CVD) is the most prominent killer within Type 1 Diabetes (T1D) with endothelial dysfunction as a major player in the development of CVD. Women with T1D experience an accelerated CVD risk despite the apparent sex-specific cardio-protection from circulating endogenous estrogen experienced by healthy pre-menopausal women. Animal models have shown the modulation of SIRT1, a NAD⁺ histone deacetylase, by estrogen as a CVD protector. This study sought to test the hypothesis that lower circulating SIRT1 is associated with reduced endothelial function in T1D women. Change in flow mediated dilation (FMD), a clinical measure of endothelial function, and SIRT1 over the menstrual cycle exhibited contrasting trends between T1D women and healthy women: increases of FMD and SIRT1 as estrogen increases in healthy women and decreases of FMD and SIRT1 as estrogen increases in T1D women. This provides evidence that signaling roles by circulating estrogen may be attenuated in T1D and that the effects of decreased SIRT1 contributes to endothelial dysfunction, resulting in determinant effects on vascular health in T1D women.

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