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Early menopause and premature ovarian insufficiency are associated with increased risk of type 2 diabetes: a systematic review and meta-analysis

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Abstract

Objective/Design Menopausal transition has been associated with a derangement of glucose metabolism. However, it is not known if early menopause (EM, defined as age at menopause <45 years) or premature ovarian insufficiency (POI, defined as age at menopause <40 years) are associated with increased risk of type 2 diabetes mellitus (T2DM). To systematically investigate and meta-analyze the best evidence regarding the association of age at menopause with the risk of T2DM. **Methods** A comprehensive search was conducted in PubMed, CENTRAL and Scopus, up to January 31, 2018. Data are expressed as odds ratio (OR) with 95% confidence intervals (CI). The I² index was employed for heterogeneity. **Results** Thirteen studies were included in the qualitative and quantitative analysis (191 762 postmenopausal women, 21 664 cases with T2DM). Both women with EM and POI were at higher risk of T2DM compared with those of age at menopause of 45-55 years (OR: 1.15, 95% CI: 1.04-1.26, P = 0.003; I²: 61%, P < 0.002 and OR: 1.50, 95% CI: 1.03-2.19, P = 0.033; I²: 75.2%, P < 0.003), respectively). Similar associations emerged when women with EM and POI were compared with those of age at menopause >45 years (OR: 1.12, 95% CI: 1.01-1.20, P < 0.02; I²: 78%, P < 0.001 and OR: 1.53, 95% CI: 1.03-2.27, P = 0.035; I²: 78%, P < 0.001), respectively). **Conclusions** Both EM and POI are associated with increased risk of T2DM.

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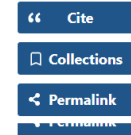
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