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Meta-Analysis of Association of Mitochondrial DNA Mutations with Type 2 Diabetes and Gestational Diabetes Mellitus

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ABSTRACT Type 2 diabetes mellitus (TIIDM) and Gestational diabetes mellitus (GDM) are two most prevalent metabolic diseases affecting humans. These two diseases are characterised by oxidative stress that has been attributed to mitochondrial dysfunction. Over two decades of research has been performed to identify the relationship of mitochondrial DNA (mtDNA) mutations with TIIDM and GDM giving many contrasting results. Thus a systematic meta-analysis was performed from literature. A total of 1279 studies were analysed and narrowed down to 57 studies based on stringent inclusion-exclusion criteria. Literature did not have enough studies to perform meta-analysis on GDM although mtDNA mutations G15928A, T3394C, T3398C, A8344G and G3316A showed association with GDM which needs to be verified on diverse populations. Meta-analysis revealed an association of mtDNA mutations T16189C, A12026G, G3316A, A8296G and A3243G with TIIDM. The paper hence suggests a strong association of the said mtDNA markers with TIIDM that may be potential biomarker for the disease.