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Crossing family histories of diabetes and cardiovascular disease leads to unexpected outcomes in diabetic offspring

Michel P Hermans [1], Sylvie A Ahn [2], Michel F Rousseau [2]

Affiliations + expand

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Abstract in English, Chinese

Background: This study investigated the isolated and crossed effects of familial histories (FH) of early onset coronary heart disease (EOCHD) and type 2 diabetes mellitus (T2DM) on diabetic offspring.

Methods: The cardiometabolic phenotype of 1098 T2DM patients was analyzed according to an FH of T2DM and/or EOCHD, including body composition, fasting insulinemia, insulin sensitivity, β-cell function (BCF), lipids, lipoprotein(a), high-density lipoprotein (HDL) number and functionality, and micro- and macrovascular complications.

Results: Mean age and T2DM duration were 69 and 18 years, respectively; 64% of patients were male, 50% (n = 550) had an FH of T2DM (DM[+]), and 13% (n = 145) had an FH of EOCHD (EOCHD[+]). Four subgroups were generated by crossing FHs: DM[-]EOCHD[-] (44%; n = 487); DM[+]EOCHD[-] (42%; n = 466); DM[-]EOCHD[+] (6%; n = 61); and DM[+]EOCHD[+] (8%; n = 84). Microangiopathies were highest among DM[+] patients, whose BCF was deteriorating the fastest. More numerous/dysfunctional HDLs characterized EOCHD[+] patients. The greatest frequency of cardiovascular disease (CVD; 69%) was observed in DM[-]EOCHD[+] patients, whose lipoprotein(a) and insulinemia were also highest (81 nmol/L and 140 pmol/L, respectively). The lowest frequency of CVD (30%) was observed in DM[+]EOCHD[-] patients.

Conclusions: Familial histories of DM and EOCHD predispose to increased microvascular and macrovascular risk, respectively, with hyperinsulinemia, lipoprotein(a), and dysfunctional HDLs standing out as mediators of the inherited macrovascular risk. Yet, crossing these FHs did not randomly redistribute vascular risk, because patients with parental T2DM had fewer macrovascular diseases regardless of familial EOCHD. The odds of being left-handed were unexpectedly greater in patients with crossed parental histories.

Keywords: 2型糖尿病; coronary artery disease; family history; insulinemia; lipoprotein(a); type 2 diabetes mellitus; 冠心病; 家族史; 胰岛素血症; 脂蛋白(a).

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