Incretin secretion was not impaired in obese Korean children and adolescents with type 2 diabetes

So Hyun Parkab, Jae Hong Kimb, Won Gyung Cho, Min Ho Junga, Sin Hee Kimb, Gyung Sun Choa, Moon Bae Ahnb, In A Jungb, Yeon Jin Jeona & Byung Kyu Suhb

aSt. Vincent's Hospital; bSeoul St. Mary's Hospital; cYeouido St. Mary's Hospital; dIncheon St. Mary's Hospital; eBucheon St. Mary's Hospital, Republic of Korea, The Catholic University of Korea

OBJECTIVES

The role of incretins in type 2 diabetes (T2D) is controversial. This study investigated the association between incretin levels in obese Korean children and adolescents with T2D.

METHODS

We performed a 2-hr oral glucose tolerance test in obese children and adolescents with T2D and with normal glucose tolerance. Twelve obese children and adolescents with newly diagnosed T2D (DM1 group) and 12 obese age-matched subjects without T2D (NDM group) were included. An oral glucose tolerance test (OGTT) was conducted and insulin, C-peptide, glucagon, glucagon-like peptide-1 (GLP-1), and glucose-dependent insulinotropic polypeptide (GIP) were measured during the OGTT. Follow-up OGTT was done to 6 patients of the DM group (DM2 group) after three day discontinuation of oral hypoglycemic agent.

RESULTS

The mean age of the patients was 13.8 ± 2.0 years, and the mean body mass index (BMI) Z-score was 2.1 ± 0.5. DM and NDM groups were comparable in age, sex, BMI Z-score, and waist:hip ratio. The DM1 group had significantly lower homeostasis model assessment of B (HOMA-B) and insulinogenic index (IGI) values (P < 0.001). The homeostasis model assessment of insulin resistance (HOMA-IR) index was not different between the two groups. Insulin and C-peptide secretions were significantly lower in the DM1 group than in the NDM group (P < 0.001). Total GLP-1 (TGLP-1) secretion was significantly higher in the DM1 group while intact GLP-1 (igl-P1) and GIP secretion values were not significantly different between the two groups. Comparing DM1 and DM2 groups, FBS, BMI, HbaA1c, HOMA-IR, and IGI values were significantly lower in the DM1 group than in the DM2 group (P < 0.05). HOMA-β was higher in the DM1 than in the DM2 group (P = 0.017). Comparing DM2 and NDM groups, TGLP-1 secretion was significantly higher in the DM2 group than in the NDM group (P = 0.04), however, TGLP-1 and GIP secretion values were not significantly different.

CONCLUSIONS

Impaired insulin secretion might be important in the pathogenesis of T2D in obese Korean children and adolescents, however, which may not be attributed to incretin secretion. Although patients had wash-out period, oral hypoglycemic agent might be able to influence on incretin secretion.