Diabetes and insulin resistance (IR) may impact growth hormone (GH), insulin-like growth factor 1 (IGF-1), and linear growth. Poorly controlled diabetes impairs growth, while high insulin may increase growth.

To understand relationships between diabetes, IR, and growth, we examine height, body mass index (BMI), glucose, GH, and IGF- in patient populations with IR, including (in order of increasing IR): congenital generalized lipodystrophy (CGL), heterozygous pathogenic variants of the insulin receptor INSR (+/-), homozygous INSR variants (INSR-/-), and autoantibodies to the insulin receptor (Type B IR).

Patients with CGL and INSR +/- have less IR, lower glucose, higher BMI, and higher IGF-1 vs patients with INSR -/- and Type B INSR. Patients with INSR -/- have short stature, while those with CGL have tall stature. GH is comparable in all groups. After remission of Type B IR, patients had normalization of insulin resistance, glucose, and IGF-1, supporting the idea that IR or elevated glucose caused low IGF-1.

Our findings suggest that severe IR causes elevated blood glucose with inadequate glucose reaching cells mimicking a starvation state and causing low IGF-1. If this occurs during childhood growth (as in INSR -/-, but not in Type B IR), it leads to short stature.

Presentation: Sunday, June 12, 2022 12:30 p.m. - 2:30 p.m.