Glucose action and adrenocortical biosynthesis in women with polycystic ovary syndrome.

OBJECTIVE: To determine if insulin or glucose action plays a role in adrenocortical steroidogenesis in the polycystic ovary syndrome (PCOS).

DESIGN: Prospective cohort study.

SETTING: Academic medical center.

PATIENT(S): Nine reproductive-aged patients with PCOS and nine age-, race-, and body mass index-matched controls.

MAIN OUTCOME MEASURE(S): Insulin-modified frequently sampled intravenous glucose tolerance testing and an acute 60-minute ACTH-(1-24) stimulation test. From the glucose tolerance test, glucose and insulin were measured and the insulin sensitivity index, glucose effectiveness, and acute insulin response to glucose were determined. Dehydroepiandrosterone sulfate (DHEAS) basally and 17-hydroxypregnenolone, 17-hydroxyprogesterone, DHEA, androstenedione, and cortisol during ACTH testing at 0 and 60 minute (steroid(0) and steroid(60)) were determined. The net change in steroid during the ACTH test was calculated.

RESULT(S): The insulin sensitivity index had
limited correlation with adrenocortical variables in both groups. In patients with PCOS, glucose effectiveness was positively associated with DHEAS, cortisol(0), cortisol(60), change in cortisol, DHEA(0), DHEA(60), change in DHEA, 17-hydroxypregnenolone(60), change in 17-hydroxypregnenolone, DHEA(0), androstenedione(0), 17-hydroxypregnenolone(0), 17-hydroxyprogesterone(0), 17-hydroxypregnenolone(60), and 17-hydroxyprogesterone(60).

**CONCLUSION(S):** Adrenocortical biosynthesis, basally and in response to ACTH, appears to be closely associated with glucose effectiveness in PCOS. A common factor determining both the effectiveness of glucose to control its own production or uptake and adrenocortical biosynthesis may be aberrant in PCOS.