

Polycystic ovary syndrome puts glucose control in double jeopardy

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This image shows Dr. Ricardo Azziz, Georgia Regents University, a reproductive endocrinologist and PCOS expert. Credit: Phil Jones

Polycystic ovary syndrome, a condition affecting about 10 percent of women and characterized by excess male hormone and increased risk of diabetes and heart disease, appears to cause a sort of double jeopardy for those struggling the hardest to control blood sugar levels, researchers report.

Humans use [insulin](#) and other non-insulin mechanisms to convert blood sugar, or glucose, into energy and control levels in the blood, where it becomes a destructive force.

A new study in the *Journal of Clinical Endocrinology & Metabolism* comparing 28 healthy women to 28 women with PCOS showed the latter have declines in both approaches, said Dr. Ricardo Azziz, reproductive endocrinologist and PCOS expert at Georgia Regents University.

Most surprising was the finding that the PCOS women who had the most difficulty controlling glucose via insulin were also the ones with declines in their ability to use non-insulin approaches. More typically, when insulin resistance increases, the body's non-insulin dependent usage increases, apparently to help compensate. In these women, non-insulin activity was essentially unchanged except in those with the most insulin resistance, where it dropped.

"Women with PCOS who have the highest levels of insulin resistance, the greatest difficulty controlling their sugar and the highest risk for [diabetes](#), appear to have a double defect in how glucose is controlled, which affects both the mechanisms that use insulin and those that do not," Azziz said.

While the amount of fat around the internal organs, called visceral fat, predicted the degree to which insulin had difficulty controlling glucose, the regulation of glucose by non-insulin means was more closely associated with the amount of fat under the skin, or subcutaneous fat.

"If the fat is not as sensitive to insulin, that obviously means [blood sugar levels](#), and probably fat and cholesterol levels as well, increase and the pancreas responds by producing more insulin," Azziz said. "Fat abnormalities can have a tremendous impact on how we feel and how we function."

The body uses insulin to convert sugar into energy for the cells in response to eating, stress or other acute causes of blood sugar increases. Fat is a big user of this approach. However, some tissues, such as the

brain, red blood cells and adrenal gland, don't require insulin to convert glucose to energy.

"That's one reason why regulating only insulin does not cure diabetes," said Azziz, noting that when fasting, about 80 percent of the body's glucose usage occurs independent of insulin.

Next steps include understanding the molecular mechanisms behind these significant differences in how PCOS affects [glucose](#) usage, Azziz said.

Provided by Medical College of Georgia

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