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Patients with inflammation more likely to develop diabetes after transplant

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Up to 30 percent of people who receive organ transplants will develop diabetes, but researchers are unsure why. Although doctors typically blame immunosuppressive drugs that transplant recipients take to prevent organ rejection, it's unclear why some people develop the lifelong disorder, while others do not. A new study in kidney transplant recipients suggests that patients with more inflammation prior to surgery are more likely to develop diabetes than those with less overall inflammation, and that a patient's fat stores also play a role. The research, published in the journal *CardioRenal Medicine,* suggests there may be opportunities for intervention and reducing the rate of diabetes in kidney recipients.

"For patients who have received a new lease on life from a donated kidney, developing diabetes can be a major blow," says first author on the study Maria Martinez Cantarin, M.D. an Assistant Professor in the Division of Nephrology at the Sidney Kimmel Medical College at Thomas Jefferson University. "We hadn't had a good sense of how diabetes could be avoided for these patients."

To get a better sense of the disease process that leads to diabetes in transplant recipients, Dr. Martinez Cantarin and colleagues took blood and tissue samples from 32 kidney recipients and, for comparison, 36 kidney donors. Of the 32 kidney recipients, 11 went on to develop diabetes within one year of follow up.

When the researchers compared levels of a chemical that instigates

inflammation, called tumor necrosis factor alpha, or TNF-alpha, they saw that patients who developed diabetes had higher levels of this chemical in their blood before their surgery than those who didn't develop diabetes, after taking into account other known factors influencing diabetes risk. In fact, for every 25 percent increase in TNF-alpha over the comparison group, the patients doubled their risk of developing diabetes.

The researchers also looked at the patients' fat tissue. "Patients on dialysis, who eventually end up needing new kidneys, typically lose weight. So we tend to think of a little extra fat as a good thing. Heavier patients do better," says Dr. Martinez Cantarin. However, when the researchers sampled fat tissue from the kidney transplant recipients and donors, the ones who developed diabetes had 40 percent higher production of TNF-alpha than those who didn't. This suggests that in some patients whose fat produced high levels of inflammatory chemicals, the fat was not protective and instead increased their chances of developing diabetes.

"The finding is important because it changes our focus as clinicians. Before, diabetes seemed like an inevitable side effect of the transplantation process," said Martinez Cantarin. "This study points to the idea that we may be able help the patient alter or control inflammation prior to transplantation in order to reduce the risk of developing diabetes," said Martinez Cantarin.

More information: Maria P. Martinez Cantarin et al. Association of Inflammation prior to Kidney Transplantation with Post-Transplant Diabetes Mellitus, *Cardiorenal Medicine* (2016). DOI: 10.1159/000446294