

Female diabetic rats transplanted with equivalent numbers of islets of Langerhans regain normal glucose levels faster than male rats

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Diabetic female Wistar Furth rats who are transplanted with freshly isolated islets of Langerhans return to a normal plasma glucose level faster than do their male counterparts. However, the effects of islet mass relative to the body weight of the smaller female animals has not been discreetly eliminated as a factor independent of gender per se. Thus, we examined influences of transplanted islet mass normalized to body weight of the animals, in order to determine if the slope (SL) of post-transplant glucose normalization is influenced by body weight. Three groups of Wistar Furth rats (9-10 wk) made diabetic with streptozotocin (55 mg/kg) were infused intraportally with 6.2 ± 0.3 islets/kg, 4.3 ± 0.2 islets/kg (females) or 3.9 ± 0.3 islets/kg (males). We determined the SL of glucose normalization by linear regression. Data were statistically analyzed by two way ANOVA. Differences in the SL between male and female rats were significant ($P < 0.05$) by General Linear Models ($df = 34$) analysis and Tukey's test ($P < 0.05$). Pearson Product Moment Correlation indicated that islets per body weight or total number of islets transplanted did not explain the SL of glucose normalization ($P > 0.05$). However, the total body fat was weakly, yet significantly correlated to the SL of glucose normalization ($P = 0.002$; $r = 0.51$). The present data demonstrate that the more rapid rate of return to normal plasma glucose levels in female rats is statistically related to gender, and not the transplanted islet mass to body weight ratio. The gender specific factors operative in this phenomenon remain unknown.