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Empagliflozin Reduces Liver Fat in Diabetic and Nondiabetic Subjects

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Abstract

Aims: To examine the effect of empagliflozin on liver fat content in T2DM and nondiabetic individuals, and the relationship between the decrease in liver fat and other metabolic actions of empagliflozin.

Research Design and Methods: 30 T2DM and 27 nondiabetic individuals were randomized to receive in double blind fashion empagliflozin or matching placebo (2:1 ratio) for 12 weeks. Subjects received 75-gram OGTT and measurement of liver fat content with MR spectroscopy before and at study end. Hepatic glucose production before the start of therapy was measured with 3-^{3}H-glucose.

Results: Empagliflozin caused 2.39%±0.79 absolute reduction in liver fat content compared to 0.91%±0.64 increase in patients receiving placebo, ($p<0.007$ with ANOVA). The decrease in liver fat was comparable in both diabetic and nondiabetic individuals (2.75%±0.81 and 1.93%±0.78, respectively, p=ns). The decrease in hepatic fat content caused by empagliflozin was strongly correlated with baseline liver fat content ($r =-0.62$, $p<0.001$), decrease in body weight ($r=0.53$, $p<0.001$) and improvement in insulin sensitivity ($r=-0.51$, $p<0.001$), but was not related to the decrease in fasting plasma glucose or HbA1c or the increase in hepatic glucose production.

Conclusion: Empagliflozin is effective in reducing liver fat content in T2DM and in nondiabetic individuals. The decrease in liver fat content is independent of the decrease in plasma glucose concentration and is strongly related to the decrease in body weight and improvement in insulin sensitivity.
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