

Held C, Gerstein HC, Yusuf S; ONTARGET/TRANSCEND Investigators. Glucose levels predict hospitalization for congestive heart failure in patients at high cardiovascular risk. *Circulation*. 2007;115:1371-5.

BACKGROUND: Patients with diabetes mellitus (DM) are at high risk of developing congestive heart failure (CHF). However, the relationships between glucose levels and CHF in people with or without a history of DM have not been well characterized.

METHODS AND RESULTS: We evaluated the associations between fasting plasma glucose and risk of hospitalization for CHF during follow-up in patients at high cardiovascular risk and without CHF enrolled in a large-scale clinical trials program. Baseline fasting plasma glucose levels were assessed in 31,546 high-risk subjects with > or = 1 coronary, peripheral, or cerebrovascular disease or DM with end-organ damage who are participating in 2 ongoing parallel trials evaluating the effects of telmisartan, ramipril, or their combination (Ongoing Telmisartan Alone and in Combination With Ramipril Global Endpoint Trial [ONTARGET]; n=25,620) and the effects of telmisartan against placebo in angiotensin-converting enzyme-intolerant patients (Telmisartan Randomized Assessment Study in ACE Intolerant Subjects With Cardiovascular Disease [TRANSCEND]; n=5926). Interim analyses blinded for randomized treatment were performed to compare baseline fasting plasma glucose with the adjusted CHF event rate at a mean follow-up of 886 days. Multivariable Cox regression models were performed, and associations were reported as hazard ratios and 95% confidence intervals. Among all subjects (mean age, 67 years; 69% men), of whom 11,708 (37%) had known DM and 1006 (3.2%) had newly diagnosed DM at baseline, 668 patients were hospitalized for CHF during follow-up. After adjustment for age and sex, a 1-mmol/L-higher fasting plasma glucose was associated with a 1.10-fold-increased risk of CHF hospitalization (95% confidence interval, 1.08 to 1.12; P<0.0001). The association persisted after adjustment for age, sex, smoking, previous myocardial infarction, hypertension, waist-to-hip ratio, creatinine, DM, and use of aspirin, beta-blockers, or statins (hazard ratio, 1.05; 95% confidence interval, 1.02 to 1.08; P<0.001).

CONCLUSIONS: Fasting plasma glucose is an independent predictor of hospitalization for CHF in high-risk subjects. These data provide theoretical support for potential direct beneficial effects of glucose lowering in reducing the risk of CHF and suggests the need for specific studies targeted at this issue.