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Fasting glucose levels within the normal range and cardiovascular risk

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Background: Elevated fasting glucose levels above the normal range are associated with increased cardiovascular risk. However, it is unknown whether this association exists with variations of fasting glucose within the normal range. Methods: The study was conducted using the computerized database of the Sharon-Shomron district of Clalit Health services. Included were subjects with fasting glucose levels within the normal range (<100mg/dL). We excluded patients with a history of cardiovascular disease or diabetes and those receiving cardiovascular (including anti-platelets, anti-hypertensive, lipid lowering or anti arrhythmic drugs) or anti diabetic medications. We collected demographic and clinical data of the participants, and examined their subsequent need for coronary revascularization with either percutaneous coronary intervention (PCI) or coronary artery bypass grafting (CABG).
Results: The 28,263 participants, 53.7±12.2 years old, were divided into quartiles according to fasting glucose levels (75.4±4.5, 83.6±1.7, 88.9±1.4, 95.1±2.2 mg/dl). During a mean follow-up of 5.9±0.7 years, 424 subjects required coronary revascularization. There was a progressive increase in the risk for coronary revascularization as fasting glucose levels were higher within the normal range (hazard ratio 1.73, 95% CI= 1.3-2.3, P=0.0001, for comparison between the fourth and first quartiles). However, this association lost its statistical significance after adjustments for age and conventional coronary risk factors (hazard ratio 1.16, 95% CI= 0.84-1.6, P=0.36).
Conclusions: Higher fasting glucose levels within the normal range are associated with an increased cardiovascular risk. This association is caused by the higher prevalence of the other conventional risk factors and not by the glucose level itself. Nevertheless, higher glucose levels within the normal range can be used as a marker for high risk patients that may benefit from a more aggressive risk factor modification.