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Evaluation of brachial artery diameter and flow-mediated vasodilatation as tools to predict cardiovascular events in type 2 diabetes patients

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Introduction: It has been suggested that brachial artery flow-mediated dilatation (FMD) evaluated by Doppler ultrasound, as a measurement of endothelial function, may predict cardiovascular events in healthy people. However, data about this test in diabetic patients is scarce. Objective: Evaluate performance of brachial artery basal diameter and FMD in predicting cardiovascular risk determined by validated scores. Methods: In this diagnostic test study, type 2 diabetic patients were submitted to clinical and laboratory evaluation. Endothelial function was evaluated with Doppler ultrasound of brachial artery, measuring basal diameter and FMD after ischemia in the forearm. ROC curves were constructed and two scores were used as reference standards to assess risk of having cardiovascular event over 10 years: UKPDS risk engine (<10% = low risk; ≥ 10% = high risk) and ASCVD (<7.5% = low risk; ≥ 7.5% = high risk). Cutoff points of basal diameter and FMD were determined based on equilibrium between sensitivity (S) and specificity (E). Results: The study included 154 patients with type 2 diabetes and clinically free of cardiovascular disease (59,7% female, mean age 63 ± 9 years, diabetes duration 16 (9– 21) years). When UKPDS risk engine was used as reference standard, the area under the curve (AUC) was 0,604 ± 0,063 (CI=0,515-0,698; P=0,083) for FMD, with S=47,2% and E=75% for the cutoff point ≤ 5.23%. For basal diameter, the AUC was 0,648 ± 0,056 (CI=0,554-0,734; P=0,019), with S=76,4% and E=50% for cutoff point > 0,306. When ASCVD score was applied, the AUC was 0,628±0,064 (CI=0,538-0,712; P=0,045) for FMD, with S= 77,2% and E= 57,7% for the cutoff point ≤ 8,17%. For basal diameter, the AUC was 0,7±0,052 (CI=0,613-0,778; P=0,002), with S= 86,1% and E= 50% for cutoff point > 0,302. Conclusion: Both FMD and basal diameter of brachial artery evaluated by Doppler ultrasound presented low to moderate accuracy to predict cardiovascular risk, determined by UKPDS risk engine and ASCVD scores in type 2 diabetes patients. The overlap of values of these tests between high and low risk patients may be the cause. Longitudinal studies evaluating cardiovascular outcomes in these patients are needed to clarify these findings. Keywords: Endothelial function, flow-mediated dilatation, cardiovascular risk. Projeto 110540