

RESERVOIR-PRESSURE ANALYSIS PREDICTS CARDIOVASCULAR EVENTS IN INDIVIDUALS WITH TYPE 2 DIABETES: A SINGLE-CENTRE STUDY

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Objective:

Altered central haemodynamics may play a crucial role in the development of cardiovascular disease (CVD), the leading cause of morbidity and mortality in individuals with type 2 diabetes (T2DM). Central haemodynamic parameters derived from reservoir-pressure analysis (RPA) have recently been shown to predict major adverse cardiovascular events (MACE) in several populations. We aimed to determine whether RPA-derived parameters would be associated with T2DM and whether these parameters would predict MACE in individuals with T2DM.

Design and method:

We studied 95 T2DM individuals with CVD (69.1 ± 8.9 yrs, 20F), 136 T2DM individuals without CVD (65.4 ± 8.5 yrs, 49F) and 72 individuals without T2DM or CVD (63.1 ± 9.0 yrs, 36F). Indices of RPA including reservoir pressure integral (INTPR), peak reservoir pressure (MAXPR), excess pressure integral (INTXSP), peak excess pressure (MAXXSP), systolic rate constant (SRC) and diastolic rate constant (DRC) were obtained by radial artery tonometry.

Results:

Logistic regression analyses revealed that INTPR [odds ratio 0.96 (95%CI 0.95–0.98)] and DRC [odds ratio 1.88 (95%CI 1.28–2.77)] were significantly associated with the prevalence of T2DM, and also that INTXSP [odds ratio 1.15 (95%CI 1.02–1.30)] and SRC [odds ratio 0.85 (95%CI 0.77–0.94)] were significantly associated with the prevalence of CVD in a pooled data set after adjusting for age and sex (all $p < 0.05$). These associations persisted after further adjusting for conventional cardiovascular risk factors. In a subset of individuals with T2DM ($n = 195$, 68.1 ± 8.3 yrs, 55F, 69CVD), three deaths (all non-cardiovascular cause) and 13 MACE (all non-fatal)

occurred during a median follow-up period of 3.0 yrs. SRC and DRC were significant independent predictors of MACE after adjusting for age and sex [SRC, hazard ratio 1.26 (95%CI 1.08–1.47); DRC, hazard ratio 2.65 (95%CI 1.19–5.89)], and further adjustments for conventional cardiovascular risk factors and previous CVD history did not affect the relationships.

Conclusions:

These findings demonstrate that RPA-derived parameters show different associations with prevalent T2DM and CVD. Furthermore, SRC and DRC predict incident CVD in individuals with T2DM. A multicentre study of T2DM is currently underway to confirm these findings.