DOPPLER INDICES OF RESISTANCE ARE SUPERIOR TO THERMODILUTION INDICES AT PREDICTING CORONARY MICROVASCULAR DYSFUNCTION

Poster Contributions
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Background: Coronary microvascular resistance (CMVR) is increasingly measured after myocardial infarction as a prognostic marker and to compare treatments. Doppler-derived Hyperaemic Microvascular Resistance (hMR) and thermodilution-derived Index of Microvascular Resistance (IMR) have been used to measure CMVR but have never been simultaneously measured in humans.

Methods: 27-patients (64±11 yrs) were recruited, 48% following an acute coronary syndrome. Simultaneous pressure, Doppler flow velocity and cold-bolus transit time were measured in 40 unobstructed coronary arteries, using a Volcano Combowire and St Jude Pressure Wire, at rest and during intravenous adenosine hyperemia. The following were calculated using standard definitions: coronary flow reserve (CFR) by thermodilution and Doppler, hMR and IMR. 3T cardiac MRI scans were carried out and Myocardial Perfusion Reserve Index (MPRI) calculated in the corresponding segments as previously described.

Results: hMR correlated with IMR (r = 0.78, p < 0.001) and with CFR by thermodilution and Doppler (r = 0.39, p = 0.02 and r = 0.38, p = 0.03). IMR did not correlate with CFR by either method. The best predictor of MPRI was hMR, followed by CFRDoppler (figure). By Delong ROC comparison analysis, hMR had superior diagnostic accuracy over IMR to predict MPRI (area under curve 0.93 versus 0.73, p = 0.04).

Conclusion: There is reasonable agreement between Doppler-derived and thermodilution indices of CMVR but hMR had greater diagnostic accuracy than IMR.