



TCT@ACC-i2: Invasive and Interventional Cardiology

IMPACT OF VENOUS PRESSURE ON FRACTIONAL FLOW RESERVE MEASUREMENT IN INTERMEDIATE CORONARY LESIONS OF HEMODIALYSIS PATIENTS

Poster Contributions

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Background: Functional assessment is important to assess lesion severity of coronary artery disease (CAD). Fractional flow reserve (FFR) has been recognized as useful modality to assess functional significance of coronary stenosis. In the calculation of FFR, venous pressure (Pv) was recognized as nearly zero. However, it remains unclear whether the omission of Pv affects FFR value in high Pv patients such as hemodialysis condition. Therefore, we evaluate the impact of Pv on FFR measurement in CAD patients with hemodialysis.

Methods: This study consisted of 23 consecutive hemodialysis patients with 28 intermediate coronary lesions (diameter stenosis >40% and <70% by visual assessment). Thermo-dilution catheter was positioned in right atrial cavity, and pressure wire was positioned as distal as possible of target coronary vessel. Hyperemia was induced with intravenous adenosine triphosphate infusion (150 µg/kg/min). During hyperemic condition, we simultaneously measured mean right atrial pressure (RAP), mean aortic pressure (Pa), and mean distal coronary pressure (Pd). We considered RAP value as Pv. Modified FFR (FFRMOD) was calculated as follows; $FFRMOD = (Pd - RAP) / (Pa - RAP)$. We assessed various hemodynamic values and compared FFR with FFRMOD. Functional significance was defined as FFR value less than 0.75.

Results: A total of 16 left anterior descending, 9 left circumflex, and 3 right coronary arteries were evaluated. In all lesions, reference vessel diameter was 2.5 ± 0.7 mm and diameter stenosis was $53 \pm 12\%$. During hyperemic condition, RAP, Pa, and Pd were 9 ± 3 mmHg, 85 ± 19 mmHg, and 67 ± 17 mmHg, respectively. FFRMOD was significantly lower than FFR (0.77 ± 0.09 vs. 0.79 ± 0.09 , $p < 0.0001$). Functional significance was observed in 13 lesions (46%) by FFRMOD whereas 7 lesions (25%) by FFR. In this study group, 6 lesions calculated with FFR >0.75 moved into <0.75 with incorporation of RAP.

Conclusions: The high venous pressure significantly affects FFR value. In CAD patients with hemodialysis, it is necessary to take account of venous pressure in the calculation of FFR.