Abstract: P18

The utility and validity of intracoronary administration of nicorandil alone for the measurement of fractional flow reserve in patients with intermediate coronary stenosis

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Background: Recently, intracoronary nicorandil (ICN) administration in addition to intravenous adenosine 5'-triphosphate (IVATP) is generally used to achieve maximal hyperemia for evaluating fractional flow reserve (FFR). This study investigated the usefulness and safety of ICN alone compared with IVATP and ICN during IVATP for the achievement of maximal hyperemia in patients with suspected angina pectoris.

Methods: Two-hundred-ten angiographically intermediate lesions in two-hundred-seven patients who underwent FFR assessments were enrolled. FFR was measured after ICN (2mg/5seconds), IVATP (150µg/kg/min) for 2 minutes, IVATP (210µg/km/min) for 2 minutes, and ICN (2mg/5seconds) during IVATP (150µg/kg/min). Maximal hyperemia was defined as the lowest FFR measured among each method.

Results: During the protocol, 92% of patients achieved maximal hyperemia with ICN2mg, 54% with IVATP 150µg/kg/min, 91% with IVATP 210µg/kg/min, and 99% with ICN2mg during IVATP 150µg/kg/min, respectively. The FFR obtained with ICN2mg were strongly correlated with those obtained with ICN2mg during IVATP150µg/kg/min (r²=0.93, P< 0.001). The mean aortic pressure drop during hyperemia was significantly lower in ICN2mg than in IVATP 150µg/kg/min, IVATP 210µg/kg/min, and ICN2mg during IVATP 150µg/kg/min(9±10, 11±14, 24±17, and 27±19mmHg, p<0.001, respectively). Despite no side effects reported during hyperemia with ICN2mg alone, transient atrioventricular block was observed in 1(1%) patient with IVATP 150µg/kg/min and 9(4%) patients with IVATP 210µg/kg/min. Also, 20 (10%) patients with IVATP 150µg/kg/min and 56(27%) with IVATP210µg/kg/min experienced chest discomfort during hyperemia.

Conclusions: The intracoronary administration of NIC2mg is safe and well tolerated, and shortens the procedure. Furthermore, intracoronary NIC2mg produced a more pronounced hyperemia than IVATP and may be the preferred mode of application for the assessment of FFR.