Continuous intracoronary infusion of saline at room temperature induces steady state maximal hyperemia

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BACKGROUND A novel catheter was developed to infuse saline at room temperature and measure thermodilution-based absolute coronary flow and microvascular resistances. During the first tests in humans we realized that this infusion was accompanied by a marked increase in coronary blood flow. The present study aimed at quantifying the extent of this hyperemic effect.

METHODS In 10 patients without significant coronary artery disease, we performed intracoronary Doppler flow velocity measurements with intracoronary infusion catheter and saline infusion at increasing rates 5, 10, 15 and 20 mL/min compared with maximal hyperemia achieved by 100 to 200 micrograms adenosine intracoronary administration. In three patients the infusion was repeated during infusion of saline without the special side holes designed to optimally mix saline and blood.

RESULTS Twelve arteries were studied. Saline infusion at 5, 10, 15, and 20 mL/min achieved respectively 46, 52, 110, and 113% of maximal coronary blood flow. The entire set-up related to this measurement took about 5 minutes. No complications occurred during these measurements.

CONCLUSIONS Direct measurement of coronary blood flow and microvascular resistances to assess coronary microcirculation is reproducible and safe with this novel coronary infusion catheter. These measurements might be proposed to evaluate the effect of new treatment targeting the coronary microvasculature.