

SCA 11

CHANGE IN THE JUGULAR BULB OXYGEN SATURATION DURING OFF-PUMP CORONARY ARTERY BYPASS GRAFT SURGERY

¹Kwak Y, ¹Lee J, ²Shim Y, ¹Kim S, ¹Oh Y, ¹Hong Y

¹Yonsei Cardiovascular Center, Yonsei University College of Medicine, Seoul, Korea; ²Yonsei University College of Medicine, Seoul, Korea

Background: The hemodynamic derangement occurs frequently during coronary artery anastomosis in patients undergoing off pump coronary artery bypass surgery (OPCAB) but its effect on blood flow to major organs has not been elucidated. The jugular bulb oxygen saturation (SjO₂) is a useful indicator of cerebral blood flow (CBF) provided that cerebral metabolic rate (CMRO₂) is constant. This study was designed to evaluate the effect of hemodynamic changes on SjO₂ during OPCAB.

Methods: With IRB approval, 35 patients were included. After the induction of anesthesia, 18 G catheter was introduced into the left jugular bulb. Hemodynamic variables as well as jugular bulb blood and arterial blood gas analysis were obtained: after sternotomy for baseline value; at 5 minutes after the beginning of the anastomosis of each coronary artery (left anterior descending artery (LAD, n=34), obtuse marginal artery (OM, n=32), posterior descending artery (PDA, n=27)); and after sternal closure. During the surgery, ventilation was controlled to maintain normocarbia

(PaCO₂ 35-40 mmHg) and mean arterial pressure (MAP) was maintained between 70-80 mm Hg. Body temperature and hemoglobin levels were also maintained constantly during the surgery. Statistical analysis was performed using one-way ANOVA and a P-value less than 0.05 was considered to be significant.

Results: The cardiac index (CI) and mixed venous oxygen saturation (SvO₂) decreased significantly during the anastomosis of the LAD (2.7 ± 0.6 L/min/m², $78.7 \pm 6.4\%$), OM (2.3 ± 0.7 L/min/m², $73.3 \pm 6.3\%$), and PDA (2.5 ± 0.6 L/min/m², $74.9 \pm 6.5\%$) compared to baseline value (3.3 ± 0.7 L/min/m², $85.8 \pm 4.0\%$). The SvO₂ were significantly lower during the anastomosis of the OM and PDA compared to the LAD. However, the SjO₂ did not change significantly during the anastomosis of the LAD ($63.2 \pm 6.8\%$), OM ($63.6 \pm 6.9\%$) and PDA ($62.9 \pm 5.5\%$) compared to baseline value ($65.3 \pm 6.8\%$) and the difference of SjO₂ among three coronary arteries was not significant.

Conclusions: Although the significant hemodynamic changes developed during OPCAB, the SjO₂, which represents the balance between CBF and CMRO₂ was well maintained during the anastomoses of all coronary arteries.

Reference:

1. Biswas S, Clements F, Diodato L, Hughes GC, Landolfo K. Changes in systolic and diastolic function during multivessel off-pump coronary bypass grafting. *Eur J Cardiothorac Surg.* 2001 Nov; 20(5): 913-7.