Effects of Intraoperative Esmolol Administration on Systemic Perioperative Inflammatory Response in an Experimental Model of Lung Resection Surgery

Fernández Peña A¹, Garutti I¹, Abubakra S¹, Galve A¹, Simon C¹, Vara E²

¹ Hospital General Universitario Gregorio Marañón

² Universidad Complutense de Madrid

BACKGROUND AND GOALS

Surgical trauma elicits inflammatory responses, including the secretion of cytokines. The activation of beta-adrenergic receptors stimulates increased secretion of pro- and anti-inflammatory cytokines. Several studies suggest that **treatment with beta-blockers inhibited the inflammatory responses** induced by trauma, sepsis or surgery. The aim of this study was to analyse the effects of **esmolol** on the **inflammatory response** in an experimental model of **lung resection surgery (LRS)** with periods of one-lung ventilation (OLV).

MATERIALS AND METHODS

21 mini-pigs were randomly assigned to 3 different groups: CONTROL (C), ESMOLOL (E) and SHAM (S). E group received an intravenous esmolol bolus (0,5mg/kg) after induction, and then a continuous perfusion of 0,05mg/kg/min during the whole procedure. S group underwent a left thoracotomy, without being exposed to LRS or OLV. At the end of LRS the animals were awakened and after 24 hours they received another general anesthesia to obtain liver biopsies. Blood samples and liver biopsies were analysed to measure different biomarkers of inflammation and glycocalyx damage. Mann-Whitney test was used to compare C vs E groups. Values of $p > 0,05$ were considered significant.

RESULTS

CONCLUSIONS

Our results suggest that **esmolol** plays an important role in **decreasing inflammatory response** in the intra and postoperative period in animals undergoing LRS. Furthermore, esmolol has **protective effects on glycocalyx** damage initiated by activation of proinflammatory **NF-KB pathways**.