Comparison of the effect of propofol versus sevoflurane on cytokine synthesis and hepatic histology in a porcine model of extensive (85 %) liver resection
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Background:

Small-for-size Syndrome (SFSS) is a major complication in extensive liver resection. It consists in postoperative liver failure as a result of reduced liver mass beyond a certain threshold¹. Portal hyperperfusion increases portal pressure and reduces hepatic arterial flow², leading to an inflammatory response carried out by several **cytokines** and to a tissue injury with **centrolobulillar necrosis and steatosis**³. Anaesthetic drugs modify hepatic circulation and have anti-inflammatory and modulatory properties⁴, so they could have an important role on the development of the SFSS. However, the effect of anaesthesia on extended hepatectomy still requires further investigation owing to its various types and combination of anaesthetic regimens. **This research aims to compare the effect of propofol vs. sevoflurane on cytokines synthesis and liver histology after extensive liver resection (85%).**

Material and methods:

N = 10 mini-pigs

P GROUP: hipnosis with propofol infusion

S GROUP: hipnosis with sevoflurane 1 MAC

Data analyzed: **B** (baseline) and **R 85%** (half an hour after 85% liver resection)

ARTERIAL SERUM ANALYSIS	LIVER HISTOLOGY(1cm³)
• NO	• Hemorrhage/ congestion
• IL1, IL2 IL4, IL8	• Portal /septal edema
• VEGF	• Endothelial cell detachment
• TNF	• Necrosis/ apoptosis

Data are expressed as **median [interquartile range]**. The statistical study was performed with **U-Mann- Whitney** using SPSS 21.

Results:

Table 1: HEPATIC ARTERY CYTOKINES AT BASELINE (B)

	NO	IL-1	IL-2	IL-4	IL-8	VEGF	TNF
Propofol	42 [23,5-60,5]	8,9 [6,3-11,5]	7,5 [5-10]	0,49 [0,32-0,66]	8,9 [1,7-16,1]	17 [11,1-22,9]	11,6 [8,8-14,4]
Sevoflurane	39 [13-65]	9,3 [2,5-16,1]	7,4 [0,9-13,9]	0,59 [0,23-0,95]	9,3 [2,6-16]	13 [3,6-22,4]	12 [7,4-16,6]

Table 2: HEPATIC ARTERY CYTOKINES AFTER 85% RESECTION

	NO	IL-1	IL-2	IL-4	IL-8	VEGF	TNF
Propofol	41 [37,4-44,6]	5,6 [2,8-8,4]	6,9 [4,1-9,7]	*0,4 [0,21-0,59]	*18,6 [6,1-31,1]	10 [5,5-14,5]	13,3 [5,5-21,1]
Sevoflurane	33 [17,4-48,6]	5,9 [3,2-8,6]	5,6 [3,7-7,5]	*0,61 [0,2-0,9]	*6,2 [3,9-8,5]	6 [4-8]	12,8 [8,64-16,9]

Table 3: HEPATIC HISTOLOGY

	Baseline	R 85%
Propofol	0,25 [0,15-0,35]	*7 [4.75-9.25]
Sevoflurane	0,2 [0,1-0,3]	*2 [1.25-2.75]

***p<0,05**

Table 3: 1 point/ item of significant liver injury (hemorrhage, congestion, portal and septal edema, endothelial cell detachment, necrosis and apoptosis)

Conclusions:

Sevoflurane seems to attenuate inflammatory response and reduce histological hepatic damage after extended liver resection compared with propofol, suggesting a protective effect that may reduce the incidence of SFSS.

Fig 1: Baseline

Fig 2: after 85% liver resection

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