Hypothermic Oxygenated Machine Perfusion for Liver Transplantation: An Initial Experience with a New Device

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Background

Hypothermic oxygenated machine perfusion could reduce ischemia-reperfusion injury after liver transplant and recent studies shows an important role of cytokines in regulation of these processes.
We tested a new ex situ machine perfusion (MP) device, PerLife® system (Aferetica, Bologna, Italy), in hypothermic setting (DHOPE), with an integrated cytokine filter (Cytosorb®) to assess the benefits in terms of inflammatory modulation and postoperative outcomes.

Methods

In this pilot study, 6 liver grafts were perfused at 10 °C and then transplanted. 3 cases with Cytosorb® (treated group) were compared with 3 cases without (non-treated group).
Perfusate samples were collected at MP start, after the first 30 min and hourly. Thereafter, interleukin 1beta, 6, 10, TNF alpha perfusate concentrations were evaluated.

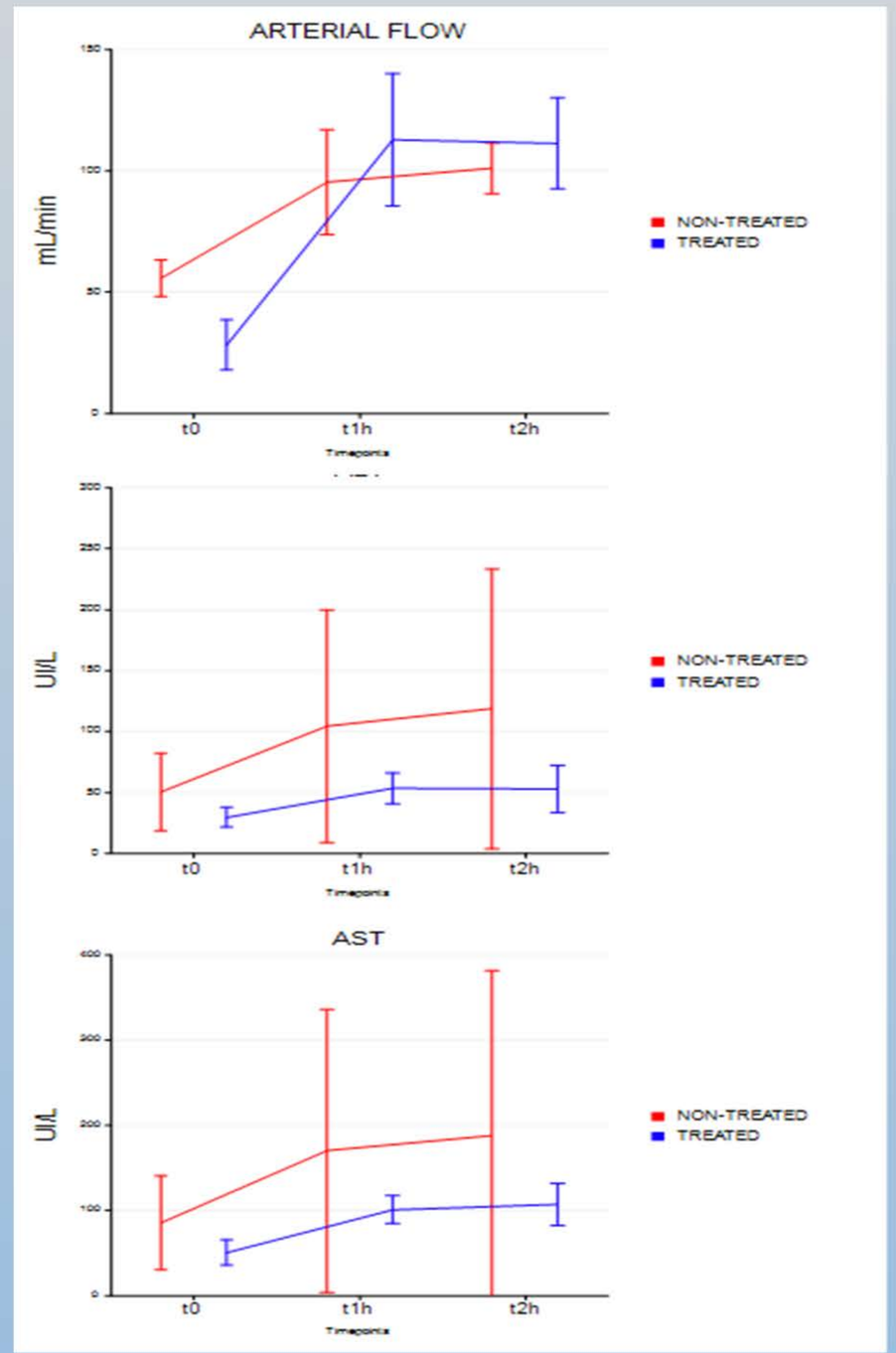
Results

Donor – Recipient Demographics		
AGE (y)	**TREATED**	**NOT-TREATED**
Donor	85 (82-89)	81 (81-82)
Recipient	55 (56-59)	54 (53-57)

IL-6 (pg/mL) at 1h	
TREATED	**NOT-TREATED**
2,1 (0,6-4,0) pg/mL	**5,4 (2,0-14,4) pg/mL**
Treated grafts showed lower cytokine levels during the perfusion	

POST-TRANSPLANT OUTCOMES		
	TREATED	**NOT-TREATED**
PRS, EAD	NONE	NONE
ALT peak	133 (110-218)	137 (129-178)
CCI at discharge	20,9 (0-20,90)	20,9 (0-33,50)
AS, IC at 6m	NONE	NONE

ABBREVIATIONS: y- years; m – months; CCI – Comprehensive Complication Index; PRS- post reperfusion syndrome; EAD – Early Allograft Dysfunction; AS – Amastomotic Stricure, IS – ischemic cholangiopathy; DATA REPRESENTATION: median (Q1-Q3)



Lower transaminases (ALT, AST) levels were observed in the treated group, both in DHOPE and in the first post operative week, even if not significantly different from the non-treated group.

Conclusions

This new device with cytokine filter seems to guarantee a better liver arterial flow under hypothermic perfusion and a reduction of cytokines in the perfusate. Further studies are obviously needed due the small number of cases.

References

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