



The use of cytokines haemoadsorption filter during ex-situ normothermic machine perfusion in liver transplantation: preliminary experience of a pilot randomized study.



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Background

Several studies correlate with cytokines release and ischemia/reperfusion injury to postoperative outcomes in liver transplantation. We assessed the safety and the potential benefits of a cytokines haemoadsorption device (Cytosorb®) integrated into a new perfusion device (PerLife®, Aferetica, Bologna, Italy) during ex-situ normothermic perfusion (NMP).

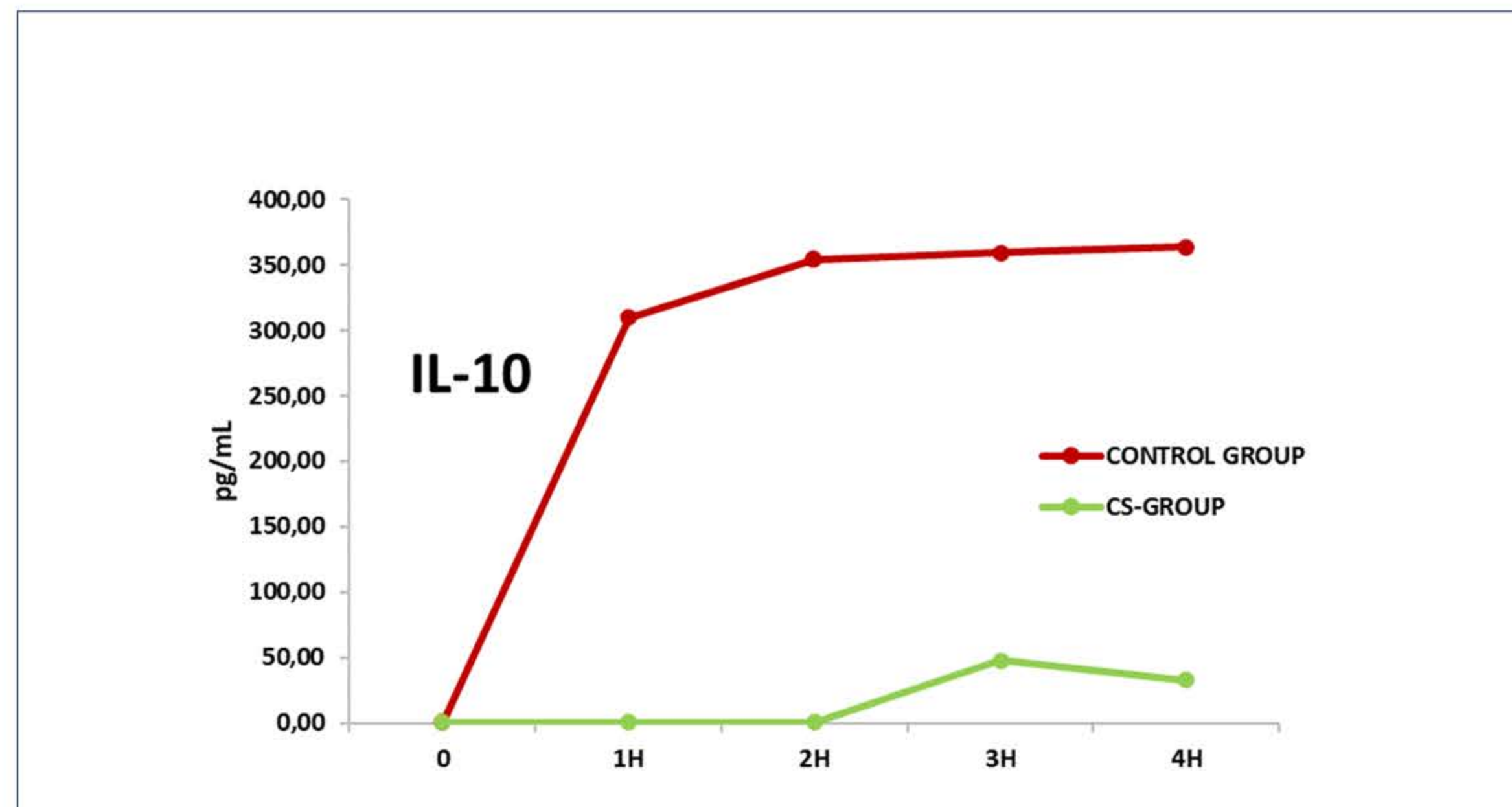
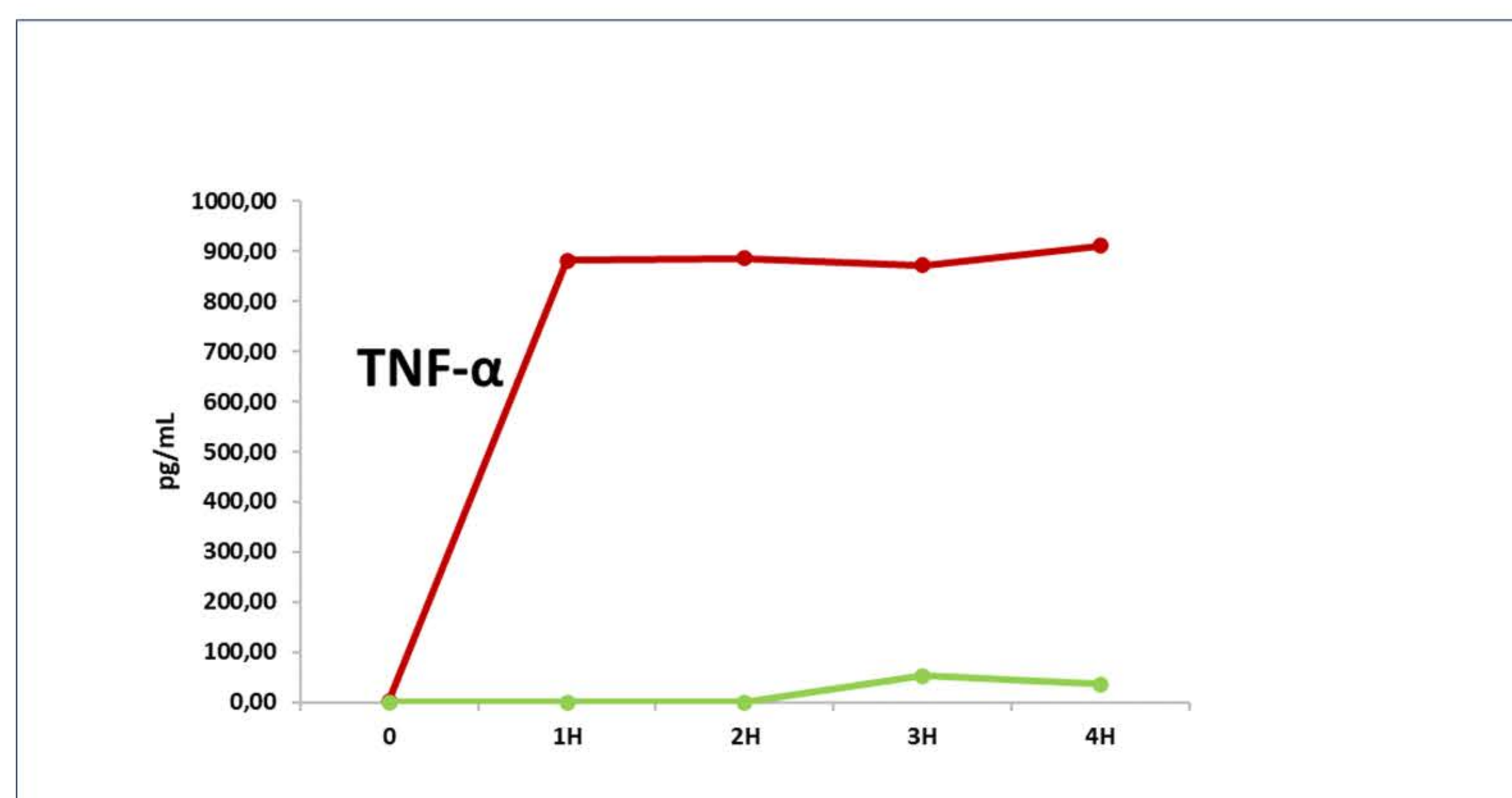
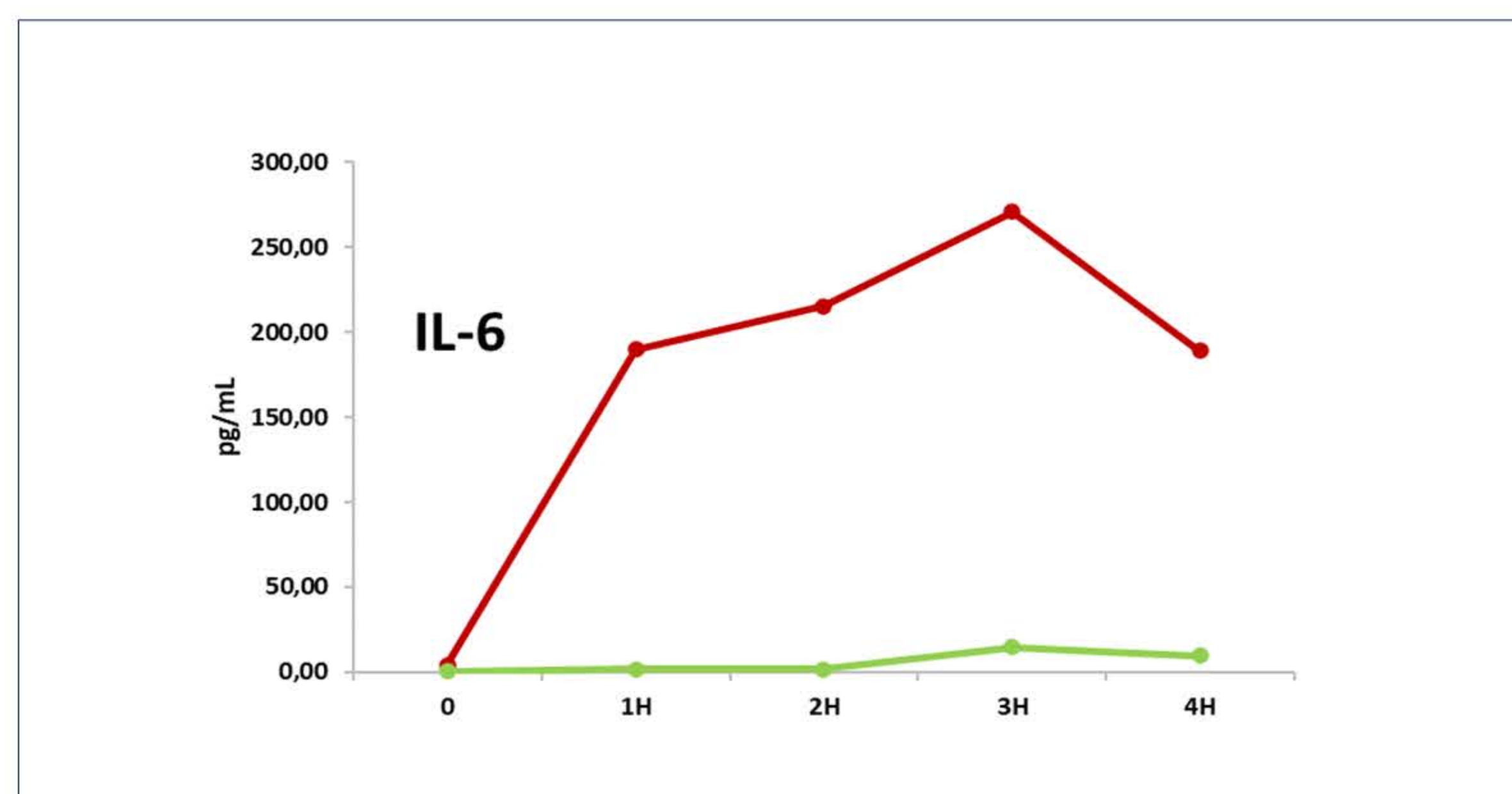
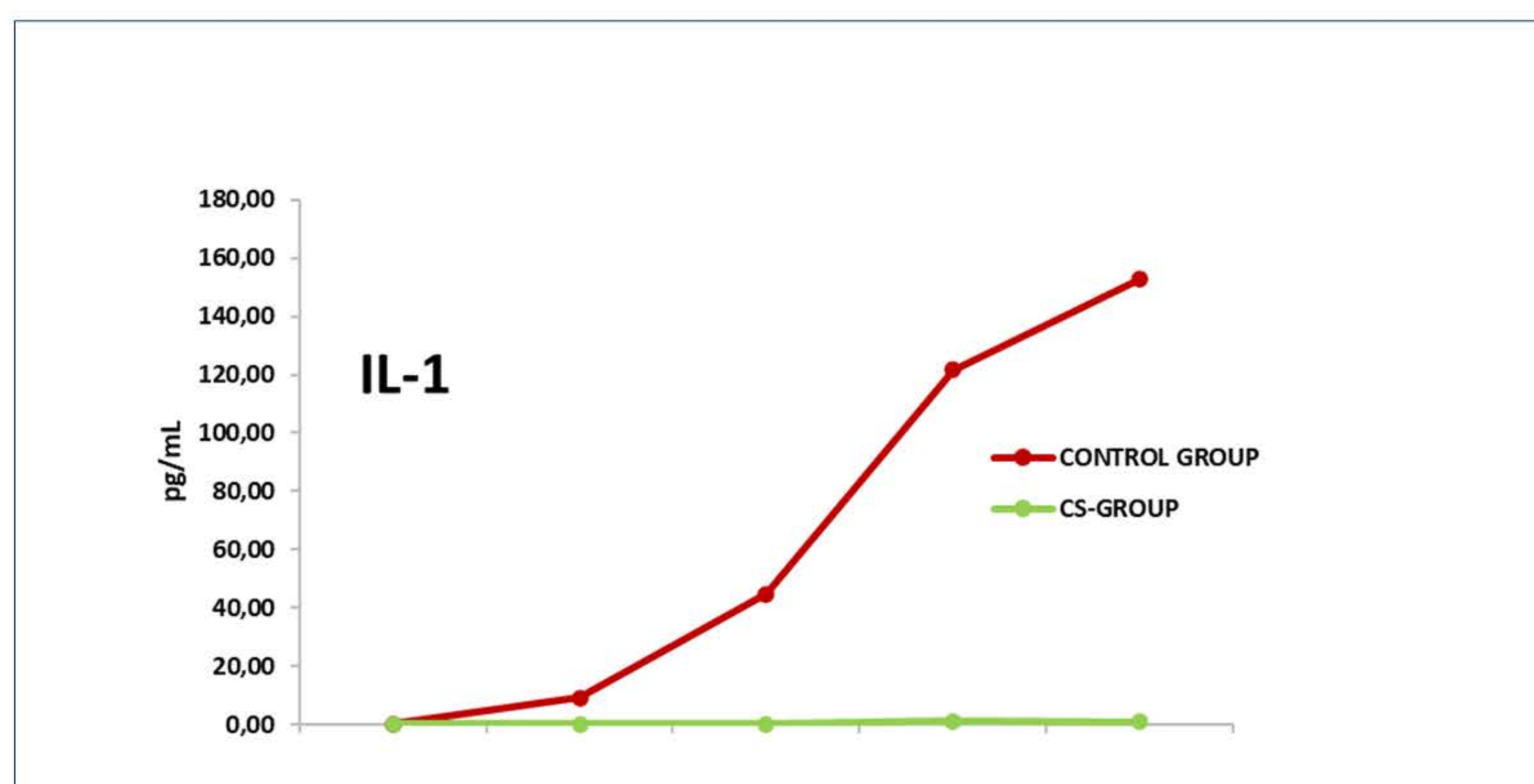
Materials and Methods

We compared postoperative outcomes in terms of intensive care unit (ICU) stay, hospital stay, complications, early allograft dysfunction (EAD), and graft survival in two groups of patients: those receiving a liver graft preserved with ex-situ normothermic machine perfusion and those with ex-situ machine perfusion with Cytosorb®. Perfusate samples were collected at commencing perfusion and hourly thereafter. IL-1, IL-6, IL-10, and TNF-alpha perfusate concentrations were evaluated together with perfusion parameters and post-operative laboratory and clinical data.

Results

Four liver grafts were perfused ex-situ with PerLife® at 37°C and eventually transplanted. Two cases were randomized to the Cytosorb® group (CS-group). The median donor age was 84 years in CS-group vs 80 years in the control group. The grafts were perfused for a median of 258 minutes (241-307). The recipient median age was 52 in CS-group vs 61 years in the controls. Median IL-1, IL-6, IL-10, and TNF-alpha at 4 hours did not statistically differ in the two groups. Median ICU stay was 6 days in CS-group and 17 in the control group (p=0.50). In the control group, one case of primary nonfunction was observed. One case of EAD was reported in the CS-group. No biliary or vascular complications were reported. Median Comprehensive Complication Index was 10.45 (8.7-12.2) in CS-group vs 40.95 (47.3-34.6) in control group (p=0.04).

Median cytokines levels



Conclusions

Cytosorb® use during NMP is safe and feasible, but its capacity to minimize cytokines perfusate concentration and clinical outcomes should be verified in large multicentric trials.

References

Ghinolfi D, Melandro F, Patrono D, Lai Q, Carlis RD, Camagni S, A new ex-situ machine perfusion device. A preliminary evaluation using a model of donors after circulatory death pig livers. *Artif Organs.* 2022;00:1-7.