

Oxygenated Machine Perfusion of Non-Heart-Beating Donor Livers at Different Temperatures

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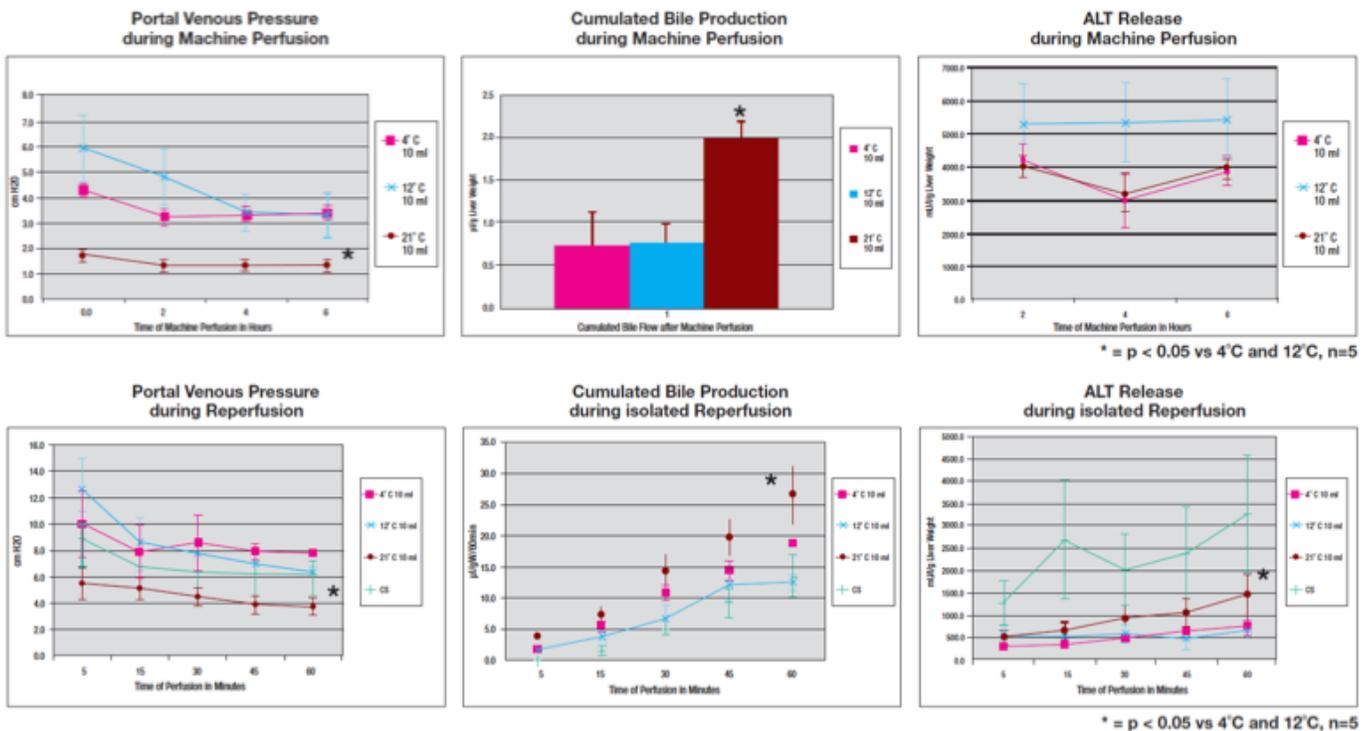
Introduction

Although the use of Non-Heart-Beating Donors has the potential to increase the number of available organs, livers are used only very scarcely because of the risk of primary non-function. There is evidence that machine perfusion (MP) is able to improve the preservation of marginal organs. The aim of this study was to evaluate the influence of the perfusate temperature during oxygenated MP on graft function.

Materials & Methods

Livers from male wister rats (250g) were harvested after 60 minutes of warm ischemia. The portal vein was cannulated, and the liver flushed with Lifor® organ preservation solution (oncoscience AG/Lifeblood, Inc.) for oxygenated MP at 4°, 12° or 21°C. Other livers were flushed with HTK and stored at 4°C by static cold storage (CS). After 6 hours all livers were isolated reperfused using Krebs- Henseleit Buffer and functional as well as structural data were collected.

Results



Results

During machine perfusion livers perfused at 21°C had a significant lower portal venous resistance and higher bile production compared to livers perfused at 4°C and 12°C. Although not significant an increased leakage of ALT was observed at higher temperatures.

Upon reperfusion all machine perfused livers had a higher metabolic activity and reduced liberation of transaminases compared to livers stored by simple cold storage. MP improved the preservation of livers from NHBD. It seems that perfusion at mild hypothermia of 21°C has positive effects on the portal venous resistance and metabolic activity, but this has to be balanced with an increased risk of parenchymal damage. Moreover, Lifor® organ preservation solution, containing microencapsulated hem as oxygen carrier, has proven to be effective in preserving livers at elevated temperatures.