Alternative Preservation Methods in ex-vivo Bovine Liver

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Liver tissue for transplant is unviable for many patients as a result of hepatocellular damage during transport. Standard cold storage, the usual method of transport has been shown in multiple studies as early as the 1990's to be sub-optimal in the effective preservation of hepatic tissue for long periods of time as a result of anoxic-metabolic degradation. Novel preservation methods such as hypothermic-machine-perfusion have revolutionized maintenance of organ viability since that time; however, access to such technology is limited in the developing world. This study examines the efficacy of three alternative, accessible and cost effective preservation solutions, namely lactated Ringer's solution, University of Wisconsin solution, and multivitamin infusion in bovine liver tissue. Cells are observed via light microscopy for signs of hypoxemic degeneration such as hepatocellular vacuolation, neutrophilic infiltration and coagulative necrosis. Lactated Ringer's solution showed the least amount of hepatocyte damage after six hours of preservation. Only 5% of cells for every 100 hepatocytes showed vacuole formation, while necrosis was not noted in any cells ($n=300$, $p<0.03$, Bonferroni adjusted). In all, this study serves as a pilot study for future experiments in which feasibility of lactated Ringer's solution as a viable human liver transport preservative is analyzed.

Awards Won:

Second Award of $2,000