

# Normothermic Ex Vivo Liver Perfusion: graft evaluation through oxygen consumption and lactate clearance.

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Argomento: Altro

**Introduction:** Proper assessment methods of graft vitality and function are still under debate. Normothermic Ex Vivo Liver Perfusion (NEVLP) is a technique that permits to evaluate and recondition liver grafts before transplantation. We implemented a preclinical model to improve graft assessment during NEVLP through measurement of oxygen consumption ( $VO_2$ ) and lactate clearance after a bolus of lactic acid.

**Material and Methods:** A 45kg pig was anesthetized and liver was retrieved without warm ischemia. After 2h of cold storage NEVLP was started. Portal vein and hepatic artery pressure targets were 8 and 65mmHg, respectively. Suprahepatic veins were cannulated. NEVLP was primed according to Porte et al. Membrane lung, placed before both artery and portal vein, was ventilated with 100%  $O_2$  and warmed at 37°C. Insulin (10UI/h), triglycerides (900mg/h), and amino acids (600mg/h) were continuously infused. After 360 minutes of NEVLP, we performed a lactate challenge through a bolus of 24 mmol of lactic acid. Perfusate was sampled every 20 minutes. Lactate clearance was computed as (lactate dose)/AUC of  $[lactate]_{PERFUSATE}$ . Data are reported as mean±standard deviation.

**Results:** NEVLP lasted 570min. During normothermia, portal vein and hepatic artery resistances were  $943\pm175$  and  $16869\pm950$  dyns/cm<sup>5</sup>, respectively. In the first 120 min lactate decreased from 12.0 to 1.1 mmol/L, see figure. Lactate challenge: the lactate bolus was completely metabolized in 80 minutes. Lactate clearance was 93 ml/min.  $VO_2$  was  $3.0\pm0.6$  (normal range: 2-4) ml/min/Hg. AST increased from 35 to 693 UI/L. The graft met the viability criteria.

**Conclusions:** Measurement of oxygen consumption and lactate clearance may contribute to optimize graft evaluation during NEVLP.

## Lactate and $\text{VO}_2$

