TITLE: **CONTINUOUS MONITORING OF MIXED VENOUS OXYGEN SATURATION DURING ORTHOTOPIC LIVER TRANSPLANTATION**

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Hemodynamic and metabolic changes during orthotopic liver transplantation (OLT) are now well documented (1). Mixed venous oxygen saturation (SVO2) is a parameter reflecting oxygen body balance; However there are no available data about the significance of continuous SVO2 monitoring during OLT.

After approval by the hospital Ethical committee, 24 patients aged 42 ± 10 yrs (mean ± SD), weighing 65 ± 15 kg undergoing OLT were investigated, and allocated in two groups: 1) with a veno-venous bypass (BP group, n = 11), and 2) without bypass (NBP group , n = 13). SVO2 was continuously measured using an Abott Opticath flow-directed pulmonary catheter. Anesthesia consisted in midazolam (50 µg.kg-1.h-1) , fentanyl (10-12 µg.kg-1.h-1), and pancuronium. Patients were mechanically ventilated with a 40% oxygen/air mixture, maintaining end-tidal CO2. tension between 30 to 35 mmHg. Hemodynamic parameters and blood samples for hemoglobin (Hb) and gas analysis were obtained at 11 different stages: incision , before and during the trial of clamping (NBP group), or before and after connecting the veno-venous bypass (BP group), beginning and end of the anhepatic stage, unclamping the inferior vena cava, unclamping the portal vein, 10 min and 1 h after unclamping, end of surgery. Total body oxygen consumption (VO2) was calculated using the Fick equation. SaO2 was never less than 97%. Hb was maintained stable between 9-13 g.dl-1. Statistical analysis was by ANOVA for repeated measures followed by appropriate post-hoc tests ($p < 0.05$ was significant).

SVO2 was not correlated to SaO2. There was no significant correlation neither between SVO2 and Hb (r = 0.25 in BP group, r = 0.13 in NBP group), nor between SVO2 and VO2 (r = 0.18 in BP group, r = 0.26 in NBP group). We found a significant correlation between SVO2 and C.I. (fig 1 and 2).

During OLT, when Hb and SaO2 are maintained within normal limits, variations of SVO2 are mainly depending on modifications of cardiac index.

Reference: 1- Mayo. Clin. Proc. 64, 232-240, 1989.

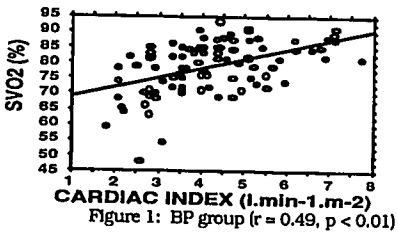

Figure 1: BP group (r = 0.49, p < 0.01)

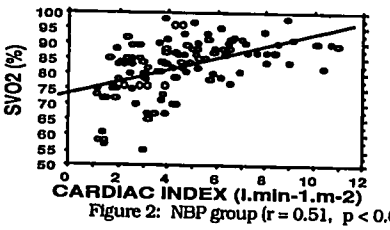

Figure 2: NBP group (r = 0.51, p < 0.01)

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TITLE: LONGTERM-ACCURACY OF CONTINUOUS FIBEROPTIC SvO_2-MONITORING

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Continuous in-vivo fiberoptic measurement of mixed venous oxygen saturation (SvO_2) has proven to be of increasing clinical value in monitoring critically ill patients (1,2,3).There are now various systems available:

A) Hemopro2 Oximetry System,Spectramed
B) Sat2-Oximeter,American Edwards Laboratories
C) Opticath,Oximetrix Inc.

The aim of our study was to examine the longterm accuracy compared to in-vitro analysis (OSM3 Hemoximeter OSM3,Radiometer).

In this prospective study 21 critically ill patients treated after major vascular surgery and mechanically ventilated required monitoring of SvO_2 with a fiberoptic pulmonary artery catheter.After obtaining informed consent from their relatives, patients were randomly assigned to one of the three devices (7 Spectramed,7 Sat2,7 Opticath) in this institutionally approved study.After in-vitro calibration the fiberoptic catheter was inserted, in-vivo recalibrations were done in a 24-hour fashion. Ventilation regimen, infusions/ transfusions and vasoactive drugs were applied individually.Every 4 hours mixed venous blood gas samples were drawn,analyzed and compared with the registrated fiberoptic value.

Mean time of using the oximetry systems was 2,5 days (Hemopro2 2.9,Sat2 2.4,Opticath 2.8)(min. 1,max. 8).Statistical analysis was performed by linear regression analysis, and bias and precision as well as Fisher-Z-Test.

Results: Comparison with OSM3 Hemoximeter

Table 1:

	Hemopro2	Sat2	Opticath2LV
r=	0,803*	0,636*	0,842*
bias	-1,651	-3,722	-0,392
precision	+/-3,049	+/-6,875	+/-3,884

* p<0.0001

Table 2: Hemopro-Opticath: z:0,666 ns
Opticath-Sat2:z:2,299 p<0,05
Hemopro-Sat2:z:1,929 ns

Bias and precision and Fisher-Z-Test lead to the following order with decreasing accuracy:Opticath(three-wave-length device)>Hemopro2(hematocrit-corrected)>Sat2.

References:
1.Gettinger A Anesthesiology 66:373(1987)
2.Reinhart K Anesthesiology 69:769(1988)
3.Hecker BR J Cardiotho Anesth 3:269(1989)