A NEW PORTABLE ECMO SYSTEM FOR MECHANICAL LIFE SUPPORT IN RESISTANT CARDIOPULMONARY FAILURE

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Introduction:
Severe cardiopulmonary failure resistant to critical care treatment leads to death of hypoxic organ failure. New treatment options for cardiopulmonary failure are necessary, especially for patients primary located in outlying medical facilities. We report our experience with a new developed, portable ECMO (Extracorporeal Membrane Oxygenation) system and describe emergency “out-of-centre” ECMO implementation and additional emergency medical service for referral hospital treatment.

Methods:
Between March 2006 and December 2008, we treated 21 adult patients with the new ECMO system (ELS-System™, MAQUET Cardiopulmonary AG, Hechingen, Germany). Diagnosis included cardio-circulatory failure (n=10) and pulmonary failure (n=11). Mechanical life support was achieved “bedside” using femoro-femoral veno-arterial vessel access in cardiocirculatory failure and femoro-jugular veno-venous cannulation in pulmonary failure. Caused by the tip-to-tip heparin coating of the circuits, full heparinization is not necessary. The whole ECMO system can work independent from wall connection points for oxygen and power supply.

Results:
Bedside cannulation was uneventful. On extracorporeal membrane oxygenation the systemic blood-flow and oxygenation were restored. Temporary limb ischemia due to the arterial cannula was observed in two cases. Estimated mortality rate before ECMO
support was 88%. Hospital survival rate was 40%.

**Conclusions:**

The use of this new portable ECMO (ELS-System™) is safe and highly effective. Especially patients in outlying medical facilities can now be first time treated with ECMO support without extended technical or personnel support. Mechanical life support is facilitated and cardiopulmonary failure has become a new treatment option. Survival rate in extremely ill patients could be improved.