EVALUATION OF CEREBRAL MICROEMBOLIZATION, LEUCOCYTES AND LIPIDS REMOVAL USING THE NEW OXYGENATOR DEVICE "REMOWELL".

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METHODS

Study design:

Prospective randomized study

Population:

31 consecutive patients randomly assigned to study group (group A:n 16) or control group (group B:n 15)

Blood Samples:

Collected before and after filtration camera and used to evaluate leukocyte concentration and lipid particles by use of a Thoma-Zeiss count-chamber

Cerebral microembolization:

Microemboli were recorded by transcranial Doppler monitor over the right middle cerebral artery during surgery

INTRODUCTION

Retransfusion of shed mediastinal blood represents a source of microembolization not only affecting brain but also kidneys, liver and spleen. Aim of this study is to evaluate the effectiveness of a new oxygenator device in removing lipid particles and leucocytes from pericardial suction blood and to assess the cerebral embolic load after lipids filtration.

RESULTS

Removell group (n=16)

Variable	Pre-Removell	Post-Removell	Difference pre-post (%)	*p*
Lipids (n°/dl)	3200 ± 1500	1050 ± 461	67	< 0,01
Leucocytes (103/µl)	4,54 ± 2,8	2,2 ± 0,7	52	< 0,01
Sedimentation Time (min)	43 ± 12			
Collected blood volume (ml)	350 ± 70			

REMOWELL GROUP - In Removell group, a significant post-filtration reduction of lipids and leucocytes was detected.

Control group (n=15)

Variable	Pre-CPB	Post-CPB	Difference pre-post (%)	*p*
Lipids (n°/dl)	3000 ± 1200	4490 ± 950	33	< 0,01
Leucocytes (103/µl)	4,73 ± 1,9	8,62 ± 2,8	45	< 0,01

CONTROL GROUP - In standard cardiotomy group, there is a significant increment of lipids and leucocytes in not-filtered blood.

Variable	Removell group (n=16)	Control group (n=15)	*p*
Microemboli (median)	29	79	< 0,01

MICROEMBOLI EVALUATION- A significant reduction in microemboli was noticed in study group compared to standard cardiotomy group.

CLINICAL EVALUATION - No relevant clinical events in terms of cerebral ischemia, renal, pulmonary o intestinal disfunction were registered.

CONCLUSIONS

- **The oxygenator device has been useful in lipids removal of shed mediastinal blood and this may be a useful tool in order to limit embolic load during ECC.**
- **No correlation between significant reduction of cerebral microembolization on CPB and neurological events was noticed.**
- **A significant leukocytes reduction in shed mediastinal blood was noticed with the removell device but no differences in terms of SIRS were found between our two groups**

FUTURE PERSPECTIVES

- **Further studies as CT or MR brain scan and early indicators of brain injury serum protein levels could be better assess the real importance of this device.**
- **A neuro-psychological evaluation could correlate instrumental data and clinical events**

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