



**10th European Conference
on
Perfusion Education and Training**

"Management in Perfusion"

**Saturday, 11th September 2010
9:00 to 17:00
Geneva, Switzerland**

**Geneva Palexpo Conference Centre
Mont Blanc room www.palexpo.ch**

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Lipid Micro Emboli and Leukocyte Filtration: A Critical Review

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Introduction: Numerous researchers have shown that cardiopulmonary bypass (CPB) plays a large role in the initiation of the systemic inflammatory response during cardiac surgery. The activation of leukocytes during this process has been implicated as one of the major contributors to post-operative tissue injury. After promising results and improving techniques, leukocyte and lipid filters are still not widely used.

Objective: This research aims to provide further evidence on the clinical benefits of several filtration techniques. A literature review showed conflicting results especially for leukocyte filtration. Several organ function, like myocardial, lung, renal and cerebral function were objects of investigation, while other investigators focused on leukocyte depletion or timing of filtration. Lipids are less investigated.

Results: It has been proven that patients were more hemodynamic stable when leukocytes were filtered. Other authors could not show less vasopressor use. Improvement of pulmonary function was easier to prove. Control groups suffered a greater degree of injury to renal tubules and glomeruli. Haematological disturbance, bleeding and blood transfusion requirements were in a multitude of studies. There was no significant adverse impact on the degree of post-operative blood loss and the need for blood transfusion. Microemboli (gaseous, fat, debris,...) are recognised as the most important contributor to cerebral injury.

Conclusion: There is evidence that leucocytes, fat and particulate all contribute to postoperative tissue injury. From a clinical point of view, the best results can be achieved with filtration of shed mediastinal blood but there is still need for large scale clinical studies.

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