

Category : **Sepsis management**

**A206 - Hemoadsorption in critical care: real world outcomes from the international cosmos registry**

**R Ferrer**<sup>1</sup>; **T Kirschning**<sup>2</sup>; **M Unglaube**<sup>3</sup>; **N Malewicz Oeck**<sup>4</sup>; **J Kreutz**<sup>5</sup>; **M Tholl**<sup>6</sup>; **B Tyczynski**<sup>7</sup>; **D Henzler**<sup>8</sup>; **T Klaus**<sup>9</sup>; **FS Taccone**<sup>10</sup>

<sup>1</sup>Vall d'Hebron University Hospital, Shock, Organ Dysfunction and Resuscitation Research Group SODIR, Barcelona, Spain, <sup>2</sup>Heart and Diabetes Center NRW, Bad Oeynhausen, Germany, <sup>3</sup>Helios Dr. Horst Schmidt Klinik Wiesbaden, Wiesbaden, Germany, <sup>4</sup>BG University Hospital Bergmannsheil, Bochum, Germany, <sup>5</sup>University Hospital, Philipps University of Marburg, Marburg, Germany, <sup>6</sup>Klinikum Oldenburg AoeR, Oldenburg, Germany, <sup>7</sup>University Clinic Essen, Essen, Germany, <sup>8</sup>Ruhr University Bochum, Hospital Herford, Herford, Germany, <sup>9</sup>CytoSorbents Europe GmbH, Critical Care, Berlin, Germany, <sup>10</sup>Hôpital Universitaire de Bruxelles HUB, Université Libre de Bruxelles ULB, Brussels, Belgium

### **Introduction:**

COSMOS is a prospective, international registry (NCT05146336) capturing utilization patterns and clinical outcomes with CytoSorb® (CS) use in critical care patients.

### **Methods:**

Clinical parameters were assessed 24 h before and after CS therapy with a 90-day follow-up. Investigators reported device-related adverse events. Analyses followed a predefined statistical plan, using descriptive statistics and paired tests. Only patients with complete datasets were included.

### **Results:**

This analysis included 306 patients (30% female, mean age 58 ± 17) from 23 sites in 6 countries. Main indications were septic shock (46.9%), cardiogenic shock (13.4%), rhabdomyolysis (12.3%), liver failure (11.4%), and ARDS (6.0%). CS was combined with RRT (90.5%), ECMO (3.9%) or used in hemoperfusion mode (6.2%). The median of baseline APACHE II and Charlson scores were 24 [19, 30] and 4 [2, 5], respectively. Over the course of CS treatment fluid balance, P/F ratio and norepinephrine improved significantly (all p<0.0001, Figure 1). Vasopressor index score improved from 20.1 [6.5, 42.4] to 7.6 [2.3, 21.7] and pH went from 7.36 [7.3, 7.42] to 7.41 [7.36, 7.45] (all p<0.0001). Platelet counts decreased from 127 [76, 197] to 70 [39, 112] x10<sup>9</sup>/L (p<0.0001) and albumin levels from 2.6 [2.3, 3.1] to 2.5 [2.2, 3.0] g/dL (p=0.02). In patients without RRT creatinine declined from 2.0 [1.2, 3.2] to 1.3 [0.8, 1.8] mg/dL (p<0.0001) and lactate from 2.1 [1.2, 3.3] to 1.4 [1.1, 1.7] mmol/L (p=0.02). Overall SOFA score improved from 12 [9, 15] to 11 [8, 14] (p<0.0001). ICU mortality was 32.7%, which was lower than predicted by risk scores. At 90 days survival rate was 56.5% with 90.1% being dialysis-free. No Serious Adverse Device Effects or Device Deficiencies were reported.

### **Conclusion:**

CS hemoadsorption as adjunct therapy in critical care patients is generally safe and helps achieve important treatment goals including reduction in vasopressors, improved oxygenation and fluid balance. These findings need to be validated in controlled studies.

### **Image :**

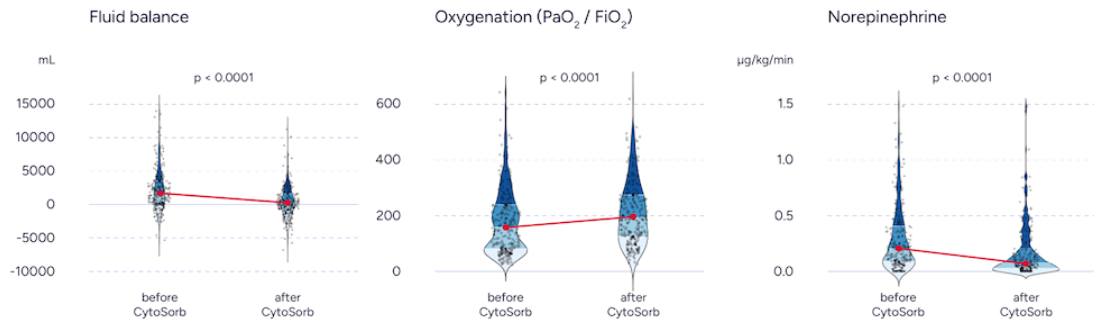


Figure 1. Changes in fluid balance, oxygenation and norepinephrine in the 24-hour periods before versus after CytoSorb® treatment; data are presented as median values with data distribution

# Hemoadsorption in Critical Care

## Real World Outcomes from the International COSMOS (CytOSorb® TreatMent Of Critically Ill PatientS) Registry

R. Ferrer<sup>1</sup>, T. Kirschning<sup>2</sup>, M. Unglaube<sup>3</sup>, N. Malewicz-Oeck<sup>4</sup>, J. Kreutz<sup>5</sup>, M. Tholl<sup>6</sup>, B. Tyczynski<sup>7</sup>, D. Henzler<sup>8</sup>, T. Klaus<sup>9</sup>, F. S. Taccone<sup>10</sup>

1. Vall d'Hebron University Hospital, SODIR, Barcelona/Spain
2. Heart and Diabetes Center NRW, Bad Oeynhausen/Germany
3. Helios Dr. Horst- Schmidt Klinik Wiesbaden, Wiesbaden/Germany
4. BG University Hospital Bergmannsheil, Bochum/Germany
5. University Hospital, Philipps University of Marburg, Marburg/Germany

6. Klinikum Oldenburg AoeR, Oldenburg/Germany
7. University Clinic Essen, Essen/Germany
8. Ruhr-University Bochum, Herford/Germany
9. CytoSorbents Europe GmbH, Medical Affairs, Berlin/Germany
10. Hôpital Universitaire de Bruxelles, Université Libre de Bruxelles, Brussels/Belgium

\*Correspondence: ricard.ferrer@vallhebron.cat

### INTRODUCTION

COSMOS is a **prospective, international registry** (NCT 05146336) capturing utilization patterns and clinical outcomes with **CytoSorb® (CS)** use in critical care patients.

### METHODS

**Clinical parameters were assessed** within 24 h before and 24 h after CS therapy with a 90-day follow-up. Investigators were asked to report device-related adverse events.

**Analyses** followed a predefined statistical plan, using descriptive statistics and paired tests. Only patients with complete datasets were included.

### RESULTS

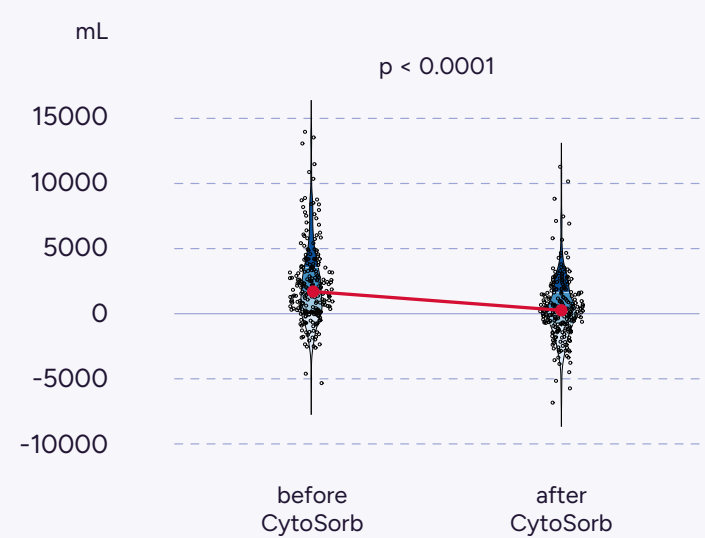
This analysis included **306 patients** (30% female, mean age  $58 \pm 17$ ) from 23 sites in **6 countries**. Main **indications** were septic shock (46.9%), cardiogenic shock (13.4%), rhabdomyolysis (12.3%), liver failure (11.4%), and ARDS (6.0%). **CS was combined with** kidney replacement therapy (90.5%), ECMO (3.9%) or used in standalone hemoperfusion mode (6.2%).

The median (interquartile) of baseline **APACHE II** and **Charlson scores** were 24 [19, 30] and 4 [2, 5], respectively. Over the course of CS treatment **fluid balance, P/F ratio and norepinephrine dosage** improved significantly (all  $p < 0.0001$ , Figure 1). **Vasopressor index score** improved from 20.1 [6.5, 42.4] to 7.6 [2.3, 21.7] and pH went from 7.36 [7.3, 7.42] to 7.41 [7.36, 7.45] (all  $p < 0.0001$ ). **Platelet counts** decreased from 127 [76, 197] to 70 [39, 112]  $\times 10^9/L$  ( $p < 0.0001$ ) and **albumin levels** from 2.6 [2.3, 3.1] to 2.5 [2.2, 3.0] g/dL ( $p = 0.02$ ).

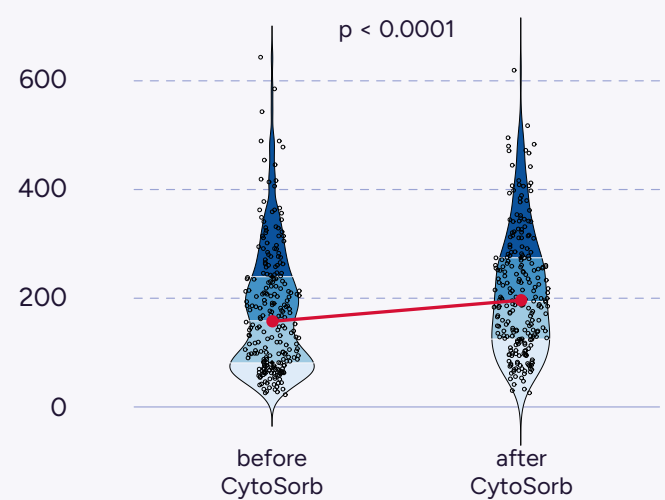
In **patients without RRT** creatinine declined from 2.0 [1.2, 3.2] to 1.3 [0.8, 1.8] mg/dL ( $p < 0.0001$ ) and lactate from 2.1 [1.2, 3.3] to 1.4 [1.1, 1.7] mmol/L ( $p = 0.02$ ). **Overall SOFA score** improved from 12 [9, 15] to 11 [8, 14] ( $p < 0.0001$ ). **ICU mortality** was 32.7%, which was lower than predicted by the scoring systems. At **90 days survival rate** was 56.5% with 90.1% being dialysis-free.

**No Serious Adverse Device Effects or Device Deficiencies** were reported.

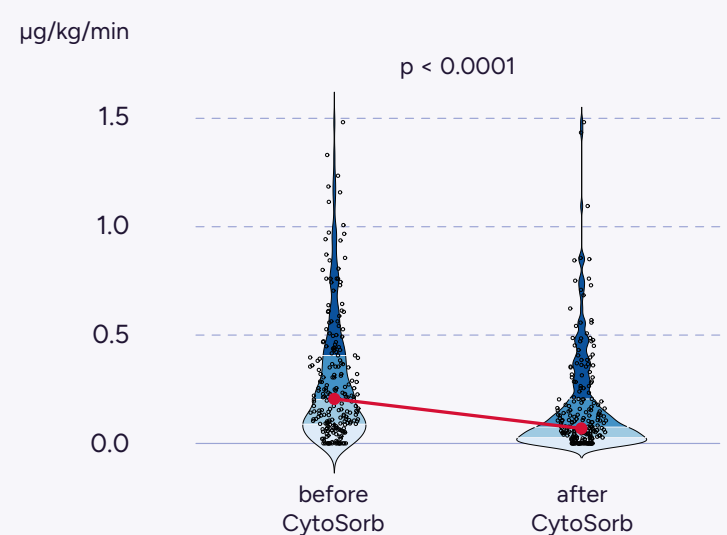
#### Fluid balance



#### Oxygenation (PaO<sub>2</sub> / FiO<sub>2</sub>)



#### Norepinephrine



**Figure 1.** Changes in fluid balance, oxygenation and norepinephrine in the 24-hour periods before versus after CytoSorb® treatment; data are presented as median values with data distribution

### CONCLUSION

**CS hemoadsorption** as adjunct therapy in critical care patients is generally safe and helps achieve important treatment goals including **reduction in vasopressors, improved oxygenation and improved fluid balance**. These findings need to be validated in future controlled studies.