

CytoSorb in Severe malaria infection: useful or harmful? A case report

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Introduction

Malaria represent a challenge in non endemic countries because of the low clinical incidence, which implicate delays in diagnosis and proper treatment. Severe forms of Malaria are almost always caused by Plasmodium Falciparum and lead to intensive care unit (ICU) admission. These can be aggravated by cerebral malaria, respiratory distress, acute kidney injury, bleeding complications, and co-infection. Despite the management advances, the mortality from imported malaria requiring ICU remains significant, with rates between 5-29%.¹

In this case report continuous renal replacement (CRRT) has started using cytosorb filter, an endotoxin and cytokines adsorption membrane currently used in our center in septic shock. Cytosorb is an hemoabsorption column composed of highly porous biocompatible polymer beads that are able to capture and absorb predominantly hydrophobic substances with molecular weight of up to 60 KDa. The cartridge can be integrated into an extra-corporeal circuit, which in our intensive care unit (ICU) is frequently a conventional continuous veno-venous haemodiafilter (CVVHDF) (Figure 1).

CytoSorb device has been approved in the European Union labeled to remove cytokines, myoglobin, bilirubin, and the antithrombotic drugs ticagrelor and rivaroxaban from blood (Figure 2).²

Case Report

A 38-years old male presented to emergency department (ED) with a history of fever, headache and fatigue, seven days after a journey in Ghana without malaria prophylaxis. Laboratory test showed a plasmodium parasitemia of 22%.

Despite at presentation in ED the patient had a Glasgow Coma Scale (GCS) of 15, he was monitored in ICU because of mild multiorgan failure (dyspnea, hyperlactatemia, jaundice, acute renal failure) and Artesunate was started, leading to a rapid and persistent suppression of parasitemia, starting from day-3 (Figure 2).

On day-4, as a consequence of worsening in neurological state, respiratory, renal and liver failures, it was executed an orotracheal intubation.

Moreover, on day-5, due to persistent zero parasitemia, CVVHDF treatment plus CytoSorb filter started with the aim of reduce the inflammatory cytokines and hyperbilirubinemia (at 26 mg/dl).

The day after, 0.1 % of parasitemia (2-4 blood cells parasitized by trophozoite per slide) was observed on the blood smear. In doubt of a possible neutralizing effect of Artesunate by CytoSorb filter, it was discontinued and clindamycin was started.

Thereafter parasitemia cleared again and stayed negative.

In 10 days, organ failure associated to plasmodium infection recovered and the patient was successfully discharged.

At one year follow-up, patient was still alive.

Conclusion

As far as we know, the present contribution represents the first report of CytoSorb application in severe malaria. Although is commonly known that CytoSorb filter is an effective strategy in preventing organ worsening from cytokines release and toxic metabolites negative effect, it could be presumed that CytoSorb filter can adsorb Artesunate leading to a rebound increase in parasitemia.

Reference

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2. Brouwer, W.P., Duran, S., Kuijper, M. et al. Hemoabsorption with CytoSorb shows a decreased observed versus expected 28-day all-cause mortality in ICU patients with septic shock: a propensity-score-weighted retrospective study. Crit Care 23, 317 (2019). <https://doi.org/10.1186/s13054-019-2588-1>

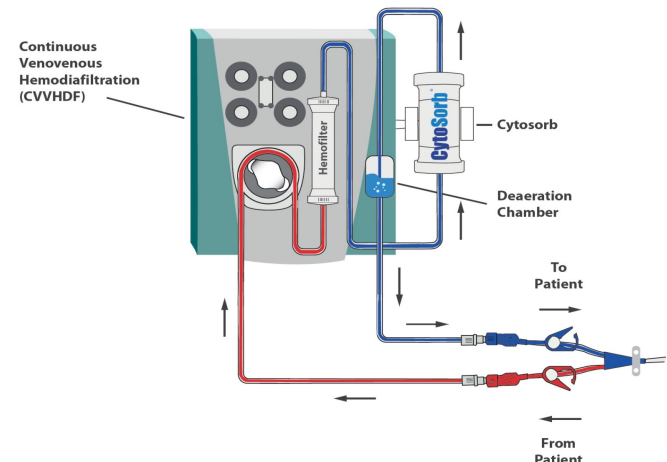


Figure 1. Adopted from «Hemoabsorption as rescue therapy for patients with multisystem organ failure in pediatric intensive care». Connection of CytoSorb into standard CRRT circuit.

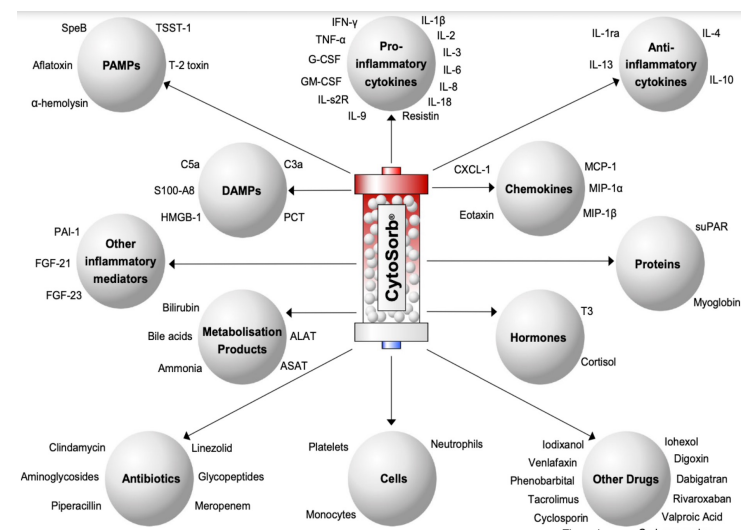


Figure 2. «Adpted from Hemoabsorption with CytoSorb®. Intensive Care Med». CytoSorb indications.

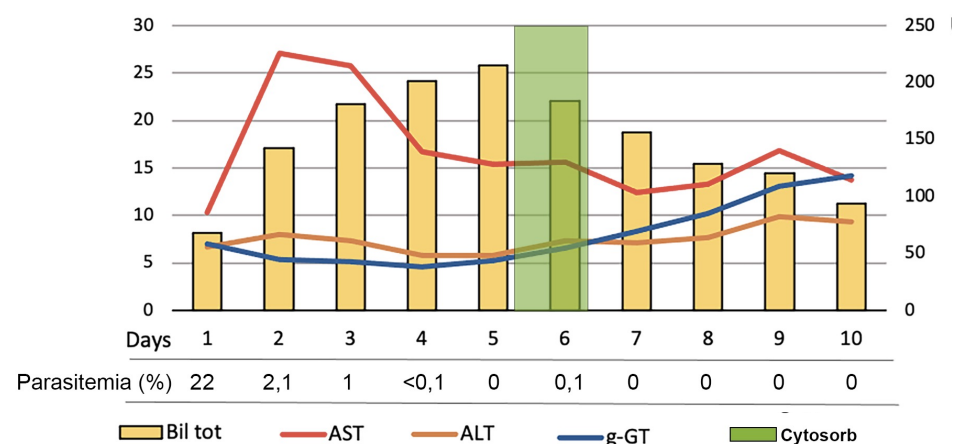


Figure 3. Liver markers and plasmodium parasitemia trends, during ICU stay