

## Use of CytoSorb in the treatment of a pediatric patient with acute hepatitis C complicated by HIV, toxic hepatitis, and liver failure

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*The case reports on a 17-year-old boy (weight 70 kg) transferred to the Children Infections Research Center intensive care unit (ICU) with severe jaundice and in a poor general condition following a 4 day stay in a city hospital.*

### Case Report

- Previous medical history included several hospitalizations over the previous 3 weeks for acute toxic hepatitis complicated by acute liver failure stage 1. The hepatitis origin was found to be methadone poisoning, confirmed by metabolites of methadone, cannabinoids, ibuprofen and metamizol found in urine samples
- Diagnostic ultrasound imaging performed in the city hospital revealed hepatomegaly and gall bladder edema. An abdominal CT also showed signs of cholecystitis and gallstones. Reactive cholecystitis was confirmed later
- On examination, following admission to the Children Infections Research Center ICU, the patient had pruritis, was icteric and was in a poor general clinical condition. He was normothermic and normovolemic, and his vigilance and appetite were intact
- Laboratory test results revealed cytolysis and cholestasis (total bilirubin 13.98 mg/dl, alanine-aminotransferase [ALAT] 3302 IU/L, aspartate-aminotransferase [ASAT] 2883 IU/L, gamma-glutamyl transpeptidase 162 IU/l). Blood tests were positive for HIV and hepatitis C
- Working diagnosis was acute viral hepatitis C genotype 1, in the icteric phase, complicated by acute liver failure stage 1 and reactive cholecystitis in the setting of HIV stage 2
- Hepatitis C was manifesting more strongly than HIV, despite the HIV virus load being high
- Due to acute hepatitis being very pronounced, antiretroviral therapy was not initiated. Antiviral medications were contraindicated for the same reason
- In the setting of cholecystitis, antimicrobial therapy with amikacin was initiated. Hormone therapy (prednisolone 90 mg/2 times daily), enzyme support (pancreatinum, potassium asparaginate, lactulose) and omeprazole to decrease acidity were started
- The patient required intensive detoxication, antioxidant cytoprotective therapy and cascade plasma filtration
- With the rationale for rapid detoxification in order to lower liver toxin concentrations, the decision was made to start CytoSorb hemoadsorption therapy

### Treatment

- One CytoSorb therapy session was performed for approximately 8 hours (could have been performed for longer, but had to be stopped due to organizational issues)
- CytoSorb was applied using the Fresenius Multifiltrate circuit in hemoperfusion mode only
- Anticoagulation: heparin 10 units/kg/hour
- Blood flow rate: 120 ml/hour

### Measurements

- Liver function markers (ALAT, ASAT, bilirubin)
- Hepatitis C virus RNA quantity
- Overall clinical condition

### Results

- Improvement in liver dysfunction was evidenced by a two-fold decrease of both ALAT and ASAT, even after only 8 hours of CytoSorb therapy. Bilirubin level also significantly decreased after CytoSorb hemoadsorption therapy (from 11.81 to 8.24 mg/dl)
- Hepatitis C virus RNA quantity decreased 100-fold
- Furthermore, his overall clinical condition improved. The boy became more active, his sleep was better, as was his appetite. Jaundice regressed, pruritis no longer bothered the patient while subsequent lab controls revealed resolving choleastasis

### Patient follow-up

- Several cascade plasma filtration procedures were performed following cessation of CytoSorb therapy
- The patient was safely discharged from the hospital with positive dynamics
- At the time of documentation, hepatosplenomegaly is still evident with the liver measuring +3 cm and spleen +1 cm

### Conclusion

- In this patient with acute hepatitis C and acute liver failure in the setting of unfavourable pre-morbid conditions of HIV and toxic hepatitis, hemoadsorption therapy helped to safely decrease bilirubin and liver enzymes levels
- According to the treating physicians, the CytoSorb treatment contributed to a significant clinical and laboratory improvement of the patient and, in addition, a spontaneous remission of the liver failure was observed in the course of decreasing viral load
- The use of CytoSorb in hemoperfusion mode was safe and easy while the therapy was well-tolerated by the patient