

Use of CytoSorb in an acute episode of multiple sclerosis

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This case study reports on a 24-year-old female patient, who presented at the hospital with painful dysfunction of the right lower limb, numbness in the face, eye movement pain and vision loss with double vision, shortly after discontinuation of steroid therapy prescribed for the initial diagnosis of multiple sclerosis.

Case presentation:

- Admission to the normal neurological ward with initiation of interferon therapy
- The patient showed mainly neurological symptoms, including vision pain, double vision, ocular nerve palsy in the right eye, hypesthesia on the right trigeminal region, and hypesthesia in the right lower leg
- Lab parameters were unremarkable, however the patient showed slightly increased plasma levels of inflammation-relevant cytokines (IL-6 1,9 pg/ml, IL-10 6,7 pg/ml, TNFa 1,5 pg/ml)
- As the symptoms could not be adequately controlled, the next escalation phase was initiated and the patient transferred to the intensive care unit to receive plasmapheresis therapy (a total of 5 cycles, each for 2 hours every 24 hours)
- Due to the young age of the patient (with worse prognosis the younger and more relapsing the clinical course), the fact that she was not sufficiently managed with interferon and the rationale to remove encephalomyelitis-triggering mediators, the first 3 plasmapheresis sessions were supplemented by CytoSorb

Treatment:

- Three treatments with CytoSorb for 2 hours, for a total duration of 72 hours (22 hour pause interval between each treatment)
- Cytosorb was applied in conjunction with CRRT (Multifiltrate, Fresenius Medical Care) run in MPS (membrane-plasma-separation) mode
- Blood flow: 200 ml/min
- Plasma exchange rate: 35 ml/min
- Anticoagulation: heparin
- CytoSorb adsorber position: pre-hemofilter

Measurements:

- Neurological parameters and clinical signs
- Parameters of inflammation (IL-6, IL-10, TNFa)

Results:

- 1st treatment: Neurological symptoms were clearly resolving after the first treatment, no more double vision, improved overall vision, reduction of eye movement pain and reduction of cytokines in the course of the treatment (IL-6 no longer detectable, IL-10 0.8 pg/ml, TNFa 1.4 pg/ml)
- 2nd treatment: Subsiding sensitivity issues in the face, no more need for analgesics (eye movement pain)
- 3rd treatment: Minimal visual deviation, minimal hypesthesia in the lower limbs and face, IL-6 and IL-10 no longer detectable, TNFa 1.2 pg/ml
- The determination of the classical inflammatory parameters (CRP, leukocytes) after the plasmapheresis sessions was intentionally omitted due to pre-existing normal values

Patient Follow-Up

- After 2 more plasmapheresis sessions, neurology was completely normal
- Transfer to the normal ward after 5 plasmapheresis sessions
- After another day on the normal ward, the patient could be discharged to a rehabilitation unit with resumed interferon therapy

Conclusions

- In this patient with an acute episode of multiple sclerosis, treatment with CytoSorb in combination with plasmapheresis resulted in a clear clinical improvement within hours and an improvement of her neurological symptoms
- The medical team reported an obvious clinical difference between the two treatment modes plasmapheresis + CytoSorb and plasmapheresis alone, with the biggest detectable leap in clinical improvement between treatments 1-3 (plasmapheresis + CytoSorb) while the speed of neurological improvement clearly slowed towards the end
- It seems reasonable to presume that in addition to the removal of cytokines, other mediators were also removed thus increasing the effectiveness of plasmapheresis as a therapy option in multiple sclerosis
- Despite the rapid improvement in this patient, it remains difficult to make any statement regarding which of the two procedures had the greater impact. Therefore, in a future patient, the procedure will be performed the other way round (treatment 1-3 plasmapheresis only, treatment 4 + 5 plasmapheresis + CytoSorb)
- The application of CytoSorb therapy was simple, safe and the installation of the adsorber in MPS (membrane-plasma-separation) mode was possible without problems