

Use of CytoSorb in a patient with severe clonazepam and quetiapine overdose

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This case reports on a 24-year-old female patient who was admitted to the hospital in an unresponsive state with suspected overdose of clonazepam and quetiapine, presumably 1 hour post ingestion.

Case Presentation

- On arrival, vital parameters were as follows: respiratory rate 24/min, temperature 38.3°C, heart rate 124/min, blood pressure 100/60 mmHg
- Subsequent arterial blood gas analysis revealed the following values: pH 7.5, HCO₃ 19.8 mmol/L, PaO₂ 59.9 mmHg, lactate 5.7 mg/dl, sodium 148 mmol/l, potassium 5.7 mmol/l
- Due to progressive signs of shock with pronounced hemodynamic instability, a norepinephrine infusion had to be commenced at 10 µg/min
- Due to progressive respiratory distress and metabolic acidosis the patient was intubated and placed on mechanical ventilation
- At this time the patient showed signs of hyperinflammation with increased inflammatory markers (procalcitonin - PCT 3.9 µg/l) as well as increased bilirubin levels (14.3 mg/dl), liver transaminase parameters including glutamate-oxalacetate-transaminase [GOT] 243 U/L and glutamate-pyruvate-transferase [GPT] 257 U/L
- This clinical picture was accompanied by oliguric renal failure necessitating the start of hemodialysis
- Plasma drug level measurements revealed decreasing clonazepam concentrations, most probably due to its shorter half-life, while quetiapine levels on the other hand, with a relatively long half-life, were still markedly elevated
- As the clinical condition in this emergency case was not improving under standard of care, a CytoSorb hemoadsorber was additionally added into the hemodialysis circuit to increase elimination of quetiapine

Measurements

- Hemodynamics and requirement for vasopressors
- Inflammatory markers
- Bilirubin and liver enzymes
- Renal function
- Blood gas levels

Treatment

- Two CytoSorb treatment sessions were performed for a total of 13 hours (both treatments for 4 hours separated from one another by an interval pause of 5 hours)
- CytoSorb was used in conjunction with a hemodialysis machine in the first treatment and was used in stand-alone mode for the second treatment
- Blood flow rate: 140-150 ml/min
- Anticoagulation was not used

Results

- Hemodynamics improved from a mean arterial pressure (MAP) of 65 to 74 mmHg with a concomitant decrease in norepinephrine requirements and a decreased heart rate
- There also was a significant decrease in inflammatory markers (PCT from 3.9 µg/l to 1.2 µg/l)
- Bilirubin levels (from 14.3 to 10.2 mg/dl) as well as liver enzymes were reduced throughout the 2 treatment cycles (GPT from 257 U/L to 128 U/L, GOT 2 from 43 U/L to 148 U/L)
- Additionally, combined treatment with hemodialysis and CytoSorb was associated with an improvement in renal function as evidenced by an increase in diuresis from 100 ml/h to 240 ml/h
- Oxygenation also improved significantly

Patient Follow-Up

- The patient could be successfully weaned off vasopressor and ventilator support 2 days after cessation of CytoSorb therapy
- She could be extubated on day 3 of her ICU stay and was transferred to the normal ward 8 days after discontinuation of CytoSorb therapy
- The patient was discharged from the hospital on day 13 in a hemodynamically stable condition

Conclusion

- In this case of a patient with severe clonazepam and quetiapine overdose combined treatment with hemodialysis and CytoSorb hemoadsorption was associated with hemodynamic stabilization, control of the inflammatory response and an improvement in renal and liver function
- This case report - with an overall improvement in the patients` clinical condition following drug intoxication - shows the effectiveness and potential of the CytoSorb adsorber in cases of drug overdose as an emergency rescue therapy
- CytoSorb could be incorporated into the hemodialysis circuit without problems and showed no adverse device-related events for the duration of therapy