Clonidine Removal by Hemoperfusion in a Uremic Patient

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Dear Sir,

Clonidine is a centrally acting antihypertensive drug, widely used in uremic patients. The drug is cleared primarily by the kidney and the half-life, which is approximately 12 h in normal subjects, raises up to 40 h in severe renal failure [1]. Despite the low molecular weight of clonidine (229), the amount of drug extracted by dialytic treatment is negligible [2], or low [3]. Severe overdose could produce severe cardiorespiratory dysfunction and coma [4, 5].

A case of clonidine overdose in a patient on regular dialytic treatment, ingested to achieve suicide and treated with hemodialysis and hemoperfusion, is reported. A.A. is a 60-year-old Caucasian male, on regular dialytic treatment since 1983, suffering from ischemic cardiopathy ingested for suicidal scope, 3,000 g of clonidine together with diazepam 10 mg in the evening. The day after, the patient presented postural hypotension (lying down 160/90 mm Hg, standing up 90/60 mm Hg), severe mental confusion and bradycardia with ectopic ventricular beats. Due to the well-known low dialysance of clonidine [4, 5], the patient was treated by hemoperfusion, using a charcoal cartridge containing 300 g of cellulose-coated charcoal (Adsorba 300 Gambro) and at the same time with a hollow-fiber dialyzer with cuprophane membrane 1.4 m2 (NT 1465 Sorin). After treatment, postural hypotension disappeared and heart rate normalized and ectopic ventricular beats disappeared, while the patient remained disoriented and with slurred speech. In the subsequent 2 days all mental symptoms disappeared and the patient returned to the previous state without any evaluable consequence.

During treatment the blood flow was 300 ml/min, and serum samples were taken at the beginning and at the end of treatment. After 1.15 h of treatment, ultrafiltration was temporarily stopped and a serum sample was taken from the blood inlet and outlet. Finally, a last sample was taken after 24 h to evaluate the half-life in the interdialytic phase.

All the serum samples were frozen at -60°C until the determination. The deter-
clearance was 126 ml/min. The clearance of clonidine was calculated by the standard formula: 
\[(A - V)/A \times 300 \times (1 - Ht),\]
where A is blood concentration at arterial, V concentration at venous side, 300 is blood flow in ml/min and Ht is hematocrit (30%). Finally, the serum level determined the day after was 5.8 ng/ml, and the interdialytic half-life was 23.07 h.
A very important overdose of clonidine was very well tolerated by the patient. In fact, the normal therapeutic range (0.8-2.0 ng/ml) [6] is much lower than the levels observed in this patient. It is noteworthy that the relationship between serum levels and hypotensive effects exist only in the therapeutic dosage, while at a higher level of the drug a further hypotensive effect is not observed [7]. The clearance of clonidine during hemodialysis and hemoperfusion is much greater than in hemodialysis alone (126 vs. 59 ml/min) [3] and the percent decrease of blood levels is more effective than during a dialysis session (57.7 vs. 37.3%). Consequently, hemoperfusion is much more effective than hemodialysis alone in the removal of clonidine, and could be considered in the treatment of clonidine overdose.

References

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