Treatment of Severe Acute Hypernatremia and Renal Failure by Hemodialysis

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cessive days. Hemodialysis prescription was as follows: dialysate sodium 138 mEq/l, blood flow rate 100-150 ml/min, no ultrafiltration and 2 h dialysis time. After initial dialysis, he responded to questions appropriately, and sodium decreased from 193 to 168 mEq/l; after second hemodialysis sodium decreased from 168 to 158 mEq/l, and after third hemodialysis sodium decreased from 158 to 148 mEq/l (fig. 1). During he-

Dear Sir,

Concerning the treatment of acute hypernatremia, Pazimno and Pazimno [1] recently reported successful treatment of acute hypernatremia with hypotonic hemodialysis (dialysate sodium 110 mEq/l). The authors reported that acute hypernatremia can be corrected by a diluted dialysate fluid on opposite sides of a semipermeable membrane without neurologic sequelae, and opted for acute hypotonic hemodialysis to avoid serious problems that could occur with acute hypernatremia. We here report a case of hypernatremia accompanied by renal failure, which was successfully corrected with hypotonic hemodialysis.

A 21-year-old man was transferred to our hospital due to a drowsy mental state and anuria. He was serving in the armed forces and trained in hot weather. Nausea, vomiting and oliguria had developed 2 days earlier and his mental state became drowsy and disoriented. At admission, he was stuporous and blood pressure was 140/90 mm Hg. Laboratory findings were as follows: sodium 193 mEq/l, potassium 5.9 mEq/l, chloride 148 mEq/l, uric acid 22.7 mg/dl, creatinine 13.5 mg/dl, blood urea nitrogen 203.5 mg/dl, CPK 2,309 U/l, serum myoglobin 2,850 ng/ml. Calculated osmolality was 465.2 mosm/kg. Arterial blood gas analysis showed pH 7.22, pO₂ 94.1 mm Hg, HCO₃ 9.1 mEq/l. Under the provisional diagnosis of acute renal failure due to rhabdomyolysis, emergency hemodialysis was commenced for 5 suc-

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a- Sodium(mEq/L) •••• BUN < mg/dl)

XT

1X1

150 J.

170

E

E

a

-100

i 15°

50

130

Hospital Day

Fig. 1. Correction of hypernatremia and azotemia by hemodialysis. Arrows indicate hemodialysis.

modialysis, there were no neurologic complications and he recovered without neurologic sequelae.

Our case showed severe hypernatremia and anuria which cannot be corrected by conventional measures. Unfortunately, in such a case, the safe rate of correction of acute hypernatremia by hemodialysis is not well established. In general, it has been reported that one should avoid rapid correc-

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tion of hypernatremia using a level of dialysate sodium that is too low, and particularly avoid a low level of dialysate sodium if BUN is > 100mg/dl[2].

In our case it was suggested that hypernatremia, considering the clinical course, developed within a short period (maybe within 48 h). Therefore, we decided to lower sodium as soon as possible to prevent neurologic complication by acute hypernatremia itself, and we selected hemodialysis as the method

for correction of hypernatremia and uremia because he was in an anuric and catabolic state (rhabdomyolysis).

With this case, we have demonstrated successful treatment of acute hypernatremia by hypotonic hemodialysis. It was suggested that early correction of acute hypernatremia before equilibration of osmolality between plasma and brain is important to prevent neurologic complication by hypernatremia itself.

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