Cephalosporin-Induced Encephalopathy in Uremic Patients

J. Geyer
D. Höffler
H.G. Demers
R. Niemeyer

Medizinische Klinik III der Städtischen Kliniken Darmstadt, BRD
Prof. Dr. D. Höffler, Medizinische Klinik III, Städtische Kliniken, Grafenstrasse 9, D-6100 Darmstadt (FRG)

Dear Sir,

Encouraged by a recently published report in this journal concerning a cefazolin-induced encephalopathy in a uremic patient [7], we would like to present our observations regarding neurotoxic side effects of modern cephalosporins.

In 1979, we observed a 41-year-old dialysis patient (45 kg) after bilateral nephrectomy who was treated for 5 days with 2 g cefazolin i.v. (t.i.d.). After 3 days, the patient developed an increasing state of confusion, psychotic behavior and uncontrolled hand tremor. 18 h after the last injection and approximately 2 h after a 4.5-hour hemodialysis, the cefazolin plasma level was 184 µg/ml. Within 4 days the neurological symptoms ceased completely [2].

In 1986, we reported a second case of cefazolin-induced encephalopathy. A 55-year-old diabetic dialysis patient (45 kg) was treated with 2 g cefazolin i.v. initially and afterwards 1 g/day. After 17 days, the patient developed increased neuromuscular excitability followed by a generalized convulsive attack. The cefazolin plasma level at that time was 95 µg/ml (the sample had been taken 8 h after the last injection). The neurological symptoms again subsided quickly [6].

Earlier, we reported on a case involving a 66-year-old dialysis patient who was being treated with high doses of the betalactamase-stable cephalosporin ceftazidim because of a life-threatening infection. After 8 days of treatment with a daily dose of 2 g ceftazidim i.v. (b.i.d.), we observed distinctive signs of neuromuscular overexcitability and confusion. The EEG indicated convulsive potentials. Within a few days, however, the neurological effects again ceased and the EEG became normal [3].

This later information on reversible neurocerebrotoxicity of betalactamase antibiotics apparently shows that we have to expect such side effects even after treatment with modern cephalosporins if extremely high doses are used. Similar observations of neurotoxicity had been reported on the elder cephalosporins [1, 8]. In order to enable the therapist to act adequately and promptly, it is important for him to be aware both of the reduction of mainly renally eliminated substances as well as of the possible side-effects discussed in the paper by Höffler [4]. It is interesting to note that cefotaxim, also at relatively high doses up to 2 g t.i.d., seems to be tolerated very well by hemodialysis patients. This can be explained by the fact that this substance is not excreted only renally, but is also metabolized [5].

References