Table 1. Serum and dialysate IGF-I, IGFBP-3 and GHBP concentrations. GHBP was not detectable in peritoneal fluid.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Number of Patients</th>
<th>Median</th>
<th>Mean</th>
<th>SD</th>
<th>Normal range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (M/F)</td>
<td>2/6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td>11.5</td>
<td>10.9</td>
<td>3.5</td>
<td></td>
</tr>
<tr>
<td>HSDS</td>
<td></td>
<td>−1.37</td>
<td>−2.3</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>GH treatment</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serum IGF-I (nmol/l) (n=8)</td>
<td></td>
<td>26.6</td>
<td>38.9</td>
<td>24.6</td>
<td>31.3–86.9</td>
</tr>
<tr>
<td>Pubertal (n=2)</td>
<td></td>
<td>24.5</td>
<td>26.7</td>
<td>8.9</td>
<td>9.7–45.1</td>
</tr>
<tr>
<td>Prepubertal (n=6)</td>
<td></td>
<td>6.4</td>
<td>6.1</td>
<td>1.34</td>
<td></td>
</tr>
<tr>
<td>Serum IGFBP-3 (µg/ml) (n=8)</td>
<td></td>
<td>6.8</td>
<td>0.57</td>
<td>2.02–5.44</td>
<td></td>
</tr>
<tr>
<td>Pubertal (n=2)</td>
<td></td>
<td>5.75</td>
<td>5.9</td>
<td>1.49</td>
<td>1.16–3.94</td>
</tr>
<tr>
<td>Prepubertal (n=6)</td>
<td></td>
<td>266</td>
<td>271</td>
<td>131.5</td>
<td></td>
</tr>
<tr>
<td>Serum GHBP (pmol/l) (n=8)</td>
<td></td>
<td>234.0</td>
<td>218</td>
<td>116.9</td>
<td>431–1892</td>
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<tr>
<td>Pubertal (n=2)</td>
<td></td>
<td>0.88</td>
<td>1.0</td>
<td>0.80</td>
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<tr>
<td>Prepubertal (n=6)</td>
<td></td>
<td>0.11</td>
<td>0.11</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>24-h IGF-I dialysate loss as % of calculated total serum IGF-I</td>
<td></td>
<td>9.7</td>
<td>10.9</td>
<td>6.7</td>
<td></td>
</tr>
<tr>
<td>24-h IGFBP-3 dialysate loss as % of calculated total serum IGFBP-3</td>
<td></td>
<td>5.5</td>
<td>6.2</td>
<td>1.97</td>
<td></td>
</tr>
</tbody>
</table>

hsds, height standard deviation score; GH, growth hormone treatment; F, female; M, male; Normal range: ±2 SD.

tonneal loss of IGF-I and IGFBP-3 was 9.7% and 5.5% of the total amount present in serum, respectively. Treatment with GH, only had influence on dialysate levels of IGF-I and IGFBP-3 (P < 0.02 and P < 0.04) in comparison to the children without GH-treatment.

Kagan et al. detected GHBP activity in peritoneal effluent in adults [7]. They reported that GHBP activity in peritoneal fluid was only 1.4% of that in serum. In our patients the concentration in dialysate was less than 4% of the serum concentration. The protein loss in peritoneal fluid is dependant on the molecular mass and the serum concentration. The relation between dialysate/serum (d/s) ratio of proteins and molecular weight was found to be linear, when plotted on a double logarithmic scale [8]. The d/s ratio of IGF-I (9.7%) with a molecular weight of 7.5 kDa is in the same range as loss of PTH, a protein with a molecular weight of 7–10 kDa. Kelle et al. also found that the IGF-I concentration in peritoneal fluid was 10% of the serum concentration [9]. The d/s ratio of IGFBP-3 was 5.5%. This percentage is in accordance with the loss of albumin (5.4%) with a molecular weight of 65–69 kDa. Kelle et al. also demonstrated that peritoneal fluid had more low molecular (35 kDa) than high molecular (150 kDa) forms of IGFBP-3.

In this study in children with ESRD, the losses of GHBP, IGF-I and IGFBP-3 in peritoneal fluid were limited. These losses play no major role in poor growth in children on PD.

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**Neurotoxicity due to imipenem/cilastatin in patients on continuous ambulatory peritoneal dialysis**

Sir,

Recently in this journal Dr Campise [1] described a patient treated with continuous ambulatory peritoneal dialysis (CAPD) who presented neurotoxicity after treatment with imipenem/cilastatin (I/C). We would like to report our experience with two patients undergoing CAPD who were treated with that antibiotic because of peritonitis.
**Nephrol Dial Transplant (1999) 14: 259**

**Cases.** A 80-year-old man with chronic renal failure secondary to glomerulonephritis and treated with CAPD since February 1996, was diagnosed of peritonitis in May 1998. He referred abdominal discomfort and cloudy peritoneal fluid. He was afebrile with a blood pressure of 110/70 mm Hg. Leukocyte count of peritoneal liquid was 2860/hpf with 1470 neutrophils and a Gram-negative bacteria was obtained on examination. Treatment with intraperitoneal/Tobramycin (loading dose 150 mg and maintenance dose 16 mg/21) was initiated. Two days later, *Klebsiella pneumoniae* grew on culture. The patient did not improve during the following days and tobramycin was withdrawn. Intraperitoneal I/C (400 mg/21) was started on day 6 after admission. Peritonitis evolution was favourable. After 10 days with I/C patient complained of myoclonus and a generalized pruriginous skin rash. Neurological examination was unremarkable. Intraperitoneal I/C dosage was reduced to 200 mg/21 with total recovery.

**Case 2.** A 45-year-old woman with end-stage-renal disease secondary to Systemic Lupus Erythematos treated with CAPD since 1995 was admitted because intense abdominal pain and turbid peritoneal liquid. Leucocyte count of liquid was 11080/hpf with 3120 neutrophils. She was afebrile and her blood pressure was 120/70 mm Hg. As she had a chronic exit-site infection by *Serratia Marcescens*, intraperitoneal Amikacin (12 mg/21) plus ceftazidime (250 mg/21) was initiated. On culture a *Serratia marcescens* grew. Since after 5 days of treatment peritoneal liquid remained turbid, intraperitoneal I/C (400 mg/21) was instituted. The patient completed a successfully 28 days cycle with I/C without relevant side effects.

**Comments.** Our patients received the recommended doses of I/C as peritonitis treatment [2]. Despite that, one of them developed neurological and cutaneous symptoms which can be attributed, in our opinion, to the antibiotic. Our patient totally recovered after reducing the dose a half.

Skin rash, pruritus, confusion, seizures, myoclonus, vomiting and diarrhea are well known side effects of I/C treatment. Its prevalence is very low in healthy people but higher in patients with renal function impairment [3]. The risk factor for developing neurotoxicity, besides renal insufficiency, are excessive dosage and previous nervous system abnormalities [4]. In a retrospective study comprising 1754 patients, low creatinine clearance, low body weight and advanced age were the more notable predisposing factors to develop seizures with I/C [5]. Those authors recommend to adjust the treatment dosage to renal function, mainly when creatinine clearance is lower than 30 ml/min, and to body weight. Nowadays, it is recommended that patients with advanced renal failure undergoing haemodialysis should not receive more than 500 mg of intravenous I/C every 12 h [6,7] and a supplemental dose should be given after haemodialysis. The pharmacokinetic of I/C on patients treated with CAPD is not well known. To our knowledge there is only one report in CAPD patients concerning intravenous administered I/C [8]. Although the recommended intraperitoneal dose of I/C is 200 mg/l in CAPD patients, we have not found reports referring its pharmacokinetics in this population.

The evolution of the first patient supports the hypothesis of Campise, who propose that recommended dosage of I/C in patients with renal failure must be revised in order to low them. In fact, our patient recovered after reducing the doses of I/C and peritonitis resolved completely.

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