Table 1. Changes in various parameters during treatment

<table>
<thead>
<tr>
<th>Term</th>
<th>Group</th>
<th>Start of treatment</th>
<th>After 12 weeks treatment</th>
<th>Interaction between two treatment groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTH (pg/ml)</td>
<td>P</td>
<td>424 ± 65</td>
<td>120 ± 25***</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>239 ± 10</td>
<td>130 ± 7***</td>
<td>*</td>
</tr>
<tr>
<td>Al-Pase (IU/l)</td>
<td>P</td>
<td>208 ± 67</td>
<td>133 ± 40***</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>178 ± 10</td>
<td>140 ± 8***</td>
<td>NS</td>
</tr>
<tr>
<td>Total calcium (mmol/l)</td>
<td>P</td>
<td>2.1 ± 0.3</td>
<td>2.2 ± 0.2*</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>2.1 ± 0.2</td>
<td>2.2 ± 0.2*</td>
<td>NS</td>
</tr>
<tr>
<td>Phosphorus (mmol/l)</td>
<td>P</td>
<td>1.42 ± 0.24</td>
<td>1.58 ± 0.26***</td>
<td>**</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>1.38 ± 0.18</td>
<td>1.91 ± 0.20***</td>
<td>**</td>
</tr>
<tr>
<td>(Ca) x (P) product (mg²/dl²)</td>
<td>P</td>
<td>36.2 ± 5.5</td>
<td>43.2 ± 7.9***</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>36.2 ± 6.5</td>
<td>47.5 ± 6.5***</td>
<td>***</td>
</tr>
<tr>
<td>Serum creatinine (mmol/l)</td>
<td>P</td>
<td>45.8 ± 18</td>
<td>55.7 ± 20.2***</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>444 ± 80</td>
<td>570 ± 90***</td>
<td>NS</td>
</tr>
<tr>
<td>24-h creatinine clearance (µ/day)</td>
<td>P</td>
<td>26.1 ± 7.3</td>
<td>20.7 ± 9.6***</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>27.9 ± 6.5</td>
<td>20.7 ± 6.8***</td>
<td>NS</td>
</tr>
</tbody>
</table>

Changes in various parameters between start of treatment and after 12 weeks treatment are shown. Statistical analysis by repeated-measures two-way ANOVA. *P < 0.05; **P < 0.01; ***P < 0.001. P, pulse Tx; C, conventional Tx.

![Pharmacokinetic study of orally administered 1,25(OH)₂D₃.](image)

Fig. 1. Pharmacokinetic study of orally administered 1,25(OH)₂D₃. The upper part shows the average data and the lower part the individual data.

conventional Tx group is the reason for the aggravation of slope.

Concerning with the pharmacokinetics of 1,25(OH)₂D₃, our results were almost same with those reported by Salusky et al. [6]. But the duration of time that the serum 1,25(OH)₂D₃ exceeded the normal range was 22 h and it was longer than the results reported by Salusky et al. (12 h) [6]. We speculate that this sustained elevation of serum 1,25(OH)₂D₃ might be one cause of the time-dependent rise in serum calcium in pulse Tx group. With regards to the most effective route (intravenous or oral) and dose (physiological or pharmacological), Quarles et al. conducted a prospective study [7], and concluded that the suppressing effect on PTH secretion was the same between intravenous and oral routes in spite of different pharmacological profiles. Our results reconfirmed the clinical usefulness of oral pulse Tx on suppressing PTH secretion. But we now consider that oral pulse Tx once per week might be advantageous to avoid the increase in serum calcium and phosphorus based on the results of pharmacokinetic study.

Nagoya University School of Medicine, Third Department of Internal Medicine, 65 Tsurumai, Showa-Ku, Nagoya, 466 Japan


Placement of central venous catheters by overinsertion of guide wires: low complication rate in 1527 central venous access devices

Sir,

Symptomatic dysrhythmia induced by a guide wire and
malposition of a catheter represent acute complications of central venous access devices [1,2]. Therefore, right atrial electrocardiography was introduced by Wilson and Gaer for proper placement of central venous lines [3]. Recently, Dionisio et al. and Galli et al. reported on the applicability of this technique for safe placement of haemodialysis catheters [4,5]. In order to find out whether overinsertion of guide wires (advancing the guide wire into the right heart to provoke dysrhythmia) is a safe procedure to assure correct catheter placement, guide-wire-associated complications of percutaneous insertion of central venous catheters were evaluated at the acute dialysis unit of the University Hospital of Vienna.

The insertion of 1527 central venous catheters was evaluated with respect to malposition and symptomatic arrhythmia during an observation period of 3 years. Double-lumen dialysis catheters, Daeron-cuffed permanent dialysis catheters, Hickman catheters, implantable port systems, and infusion catheters were implanted for the care of renal failure and cancer patients. Catheters were placed by staff and rotating physicians using Seltinger’s technique and thoracal electrocardiogram monitoring. Application of fluoroscopic technique or ultrasound guided puncture was limited to patients with venous stenosis or thrombosis due to previous catheters. Following venous puncture the guidewire was over-inserted into the right heart, indicating proper placement along the superior vena cava. Once dysrhythmia was registered, the guidewire was relocated into the superior vena cava and the sheet and/or the catheter (<20 cm length) was introduced.

In our patients no haemodynamic relevant dysrhythmia necessitating other therapeutic interventions than repositioning of the guide wire (asymptomatic dysrythmia was seen in about 50% of our patients) was observed. In a recent study atrial arrhythmias and ventricular ectopy occurred with a frequency of 41 and 25% respectively. Similar to our study, no malignant arrhythmia was observed [6]. This is in contrast to the data of McDowell et al. who described symptomatic ventricular tachycardia in 1% (2/200) of haemodialysis patients [7] and Brothers et al. who described a complication rate of 0.9% (3/329) in cancer patients [8].

Following puncture of the right subclavian vein eight catheters were misplaced into the right jugular vein and seven catheters into the left subclavian vein. Two catheters were misplaced into other vessels. Five catheters were inserted via the right jugular vein were all misplaced into the right subclavian vein. Of two catheters inserted via the left jugular vein, one was introduced into the right jugular vein and the other, even though using fluoroscopic technique, was repeatedly located in the left subclavian or the right jugular vein. One catheter inserted via the left subclavian vein was located in the left jugular vein. Thus the application of this technique resulted in a very low malposition rate of 1.64% (25/1527) compared to 4.2% (15/355) in other studies [9].

We therefore conclude that overinsertion of guidewires, monitored by transthoracic electrocardiography, represents a useful and safe technique to assure proper placement of central venous access devices in chronic renal failure and cancer patients.

Klinische Abteilung für Nephrologie und Dialyse, Universitätsklinik für Innere Medizin III, Universität Wien, Wien, Austria

G. Sunder-Plassmann
M. Muhm
W. Drum


Interferon-alpha treatment of haemodialysis patients with chronic viral hepatitis and its impact on kidney transplantation

Sir,

In a recent issue of a journal [1], there was an interesting paper on interferon (INF)-alpha therapy in haemodialysis patients with chronic viral hepatitis. It was stated in the abstract that ‘interferon-alpha has not been used previously in haemodialysis patients with chronic hepatitis’. Therefore, I am very pleased to give more information about INF therapy on our haemodialysis patients with chronic hepatitis C virus (HCV) infection [2].

Forty-five adult patients with chronic HCV infection who had elevated transaminases and histologically proven chronic hepatitis were treated with interferon-alpha (Roferon, Roche) 3 million units three times a week for 6 months. All patients had evidence of HCV infection with HCV RNA (polymerase chain reaction) and antibody to HCV in serum (by second generation ELISA). Seventeen of the 45 patients had chronic renal failure (CRF).

Fifteen of 17 haemodialysis patients with chronic HCV infection (58%) and 14 patients of 28 patients without CRF (50%) had a complete biochemical response (normalization of serum ALT levels) at the end of the 6th month of therapy. The rate of complete response was higher in haemodialysis patients compared those with normal renal function (P<0.05). Five haemodialysis patients and eight patients with normal renal function showed histological improvement in control liver biopsy after interferon therapy. The administration of INF was not associated with any severe complications. Five haemodialysis patients and seven patients without chronic renal failure showed increase in serum ALT level at 3 months after INF therapy.

Four patients with CRF had renal transplantation after another 6 months follow up, with normal serum ALT levels. Three patients received kidneys from first-degree relatives and one from a cadaver. One patient underwent liver biopsy 6 months after kidney transplantation, and liver histology showed no differences compared to previous pre- and post-treatment biopsies. The renal recipients were followed for...