PROLACTIN IN CHRONIC RENAL FAILURE, HAEMODIALYSIS, AND TRANSPLANT PATIENTS

R Peces, S Casado, M Frutos, C Horcajada, J M López-Novoa, L Hernando

Department of Nephrology, Fundación Jiménez Díaz, Madrid, Spain

Several groups [1-3] have reported that plasma prolactin (PRL) levels are elevated in patients with renal failure. The significance of the hyperprolactinaemia remains speculative.

This study was conducted in order to assess hypothalamo-pituitary regulation of PRL secretion. We evaluated the stimulatory effect of TRH and the inhibitory effect of the dopamine-agonist bromocriptine in patients with chronic renal failure, before and during haemodialysis therapy, and after a successful renal transplant.

Patients and Methods

(1) Twelve patients (6 men and 6 women, 15 to 53 years of age) with chronic renal failure, not yet on dialysis and with serum creatinine varying from 6.5 to 16.3mg/dl (CRF).
(2) Thirty patients (17 men and 13 women, 16 to 52 years of age) undergoing maintenance haemodialysis, three times weekly, 4 to 5 hr per dialysis, with coil dialysers. The duration of dialysis was 1 to 70 months (HD).
(3) Nineteen patients (16 men and 3 women, 18 to 54 years of age) with a functioning kidney transplant from 3 to 75 months and mean creatinine of 2mg/dl (RT).
(4) Seventeen normal controls (9 men and 8 women), ages ranging from 23 to 37 years (C).

Patients from CRF group were clinically stable and their nutritional status was well maintained by adequate intake of protein and sufficient calories. In the HD patients dietary protein was not restricted. Both groups received aluminium hydroxide, multivitamins and ferrous sulphate. The RT patients received prednisone and azathioprine, 20mg every other day and 100mg daily, respectively. Neither the patients nor the controls were receiving medication known to alter plasma prolactin levels.

A basal blood sample was obtained, and after 500μg of synthetic TRH i.v.
blood samples were taken at 15,30,60 and 120 min.

Blood samples were taken between 8 and 10 a.m. by venepuncture under conditions of minimal stress.

Prolactin was measured by RIA with a kit provided by CEA (Sorin).

Results

The results of basal PRL levels, and the response to TRH and to bromocriptine are summarised in Table I.

TABLE I. Plasma PRL Response to Stimulation and Suppression

<table>
<thead>
<tr>
<th>Group</th>
<th>TRH (500μg i.v.)</th>
<th>Bromocriptine (2.5mg/12 h)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Basal (ng/ml)</td>
<td>Peak (ng/ml)</td>
</tr>
<tr>
<td>Control</td>
<td>10.0±1.7</td>
<td>39.9±5.1</td>
</tr>
<tr>
<td>CRF</td>
<td>42.9±9.9</td>
<td>59.5±9.3</td>
</tr>
<tr>
<td>p*</td>
<td>&lt;0.0025</td>
<td>&lt;0.0025</td>
</tr>
<tr>
<td>p†</td>
<td>&lt;0.0005</td>
<td>&lt;0.0005</td>
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</table>

| HD     | 24.0±3.0        | 33.7±3.2                  | 56.3±10.0      | 25.3±2.1      | 15.0±1.5                  | 40.8±3.1                  |
| p*     | <0.0025         | <0.0005                   | (30)           | (27)          | (27)                      | (27)                      |
| p†     | <0.01           | NS                        | NS             | NS            |                          |                           |

| RT     | 7.4±1.7         | 35.2±5.7                  | 687.2±185.0    | 16.7±3.7      | 6.0±2.8                  | 67.9±7.7                  |
| p*     | NS              | <0.05                     | (19)           | (7)           | (7)                      | NS                        |

* The significance of the difference between the mean of each group and the control
† The significance of the difference between HD and CRF

Values are given as mean ±SEM. The significance of the differences between groups was determined by Student’s t test

Conclusions

CRF and HD patients showed increased basal levels of PRL and a blunted and delayed response to TRH. After renal transplant plasma PRL levels became normal. The response to bromocriptine and TRH was normal, but in the latter test, PRL levels did not return towards baseline at 120 min.

Data shown by CRF and HD patients suggest a decreased renal catabolism and/or impaired hypothalamo – pituitary regulation of PRL secretion. The maintenance of high PRL levels 120 min after TRH in RT patients suggests a decreased metabolic clearance which may be mediated by the steroids [4].
References


4 Marshall, S, Huang, HH, Kledzik, GS, Campbell, GA and Meites, J (1978) Endocrinology, 102, 869