Relationship between urinary and serum growth hormone and pubertal status

Sir,—We read with interest the paper by Crowne et al. on the relationship between serum and urinary growth hormone concentrations during puberty.1 As the authors pointed out, we carried out very similar studies and came to very different conclusions. In our early studies of 24 normal children of both sexes over the full range of pubertal stages we found very good correlation (r=0.79, p<0.001) between urinary growth hormone excretion and overnight mean plasma growth hormone concentration.2 We have recently extended these studies comparing diabetic and normal adolescents and found the same correlation in both patient groups (r=0.70, p<0.001).3

Crowne et al suggest that the discrepancy between their study and ours could be explained by the fact that we studied mostly children in early puberty. In fact the predominance was in late (Tanner stages 3-5, n=15) rather than early puberty (stages 1-2, n=9). We have reanalysed our most recent results and still observe the same good correlation between urinary and plasma growth hormone in late (r=0.69, n=17) and early (r=0.71, n=19) puberty in both sexes.

The methodology for measurement of both urinary and plasma growth hormone concentrations was very similar in our studies and that of Crowne et al, and we believe that the important differences between the two studies are the collection methods and the way the urinary growth hormone data are presented. In the majority of their subjects Crowne et al used a 24 hour collection period with a 20 minute sampling interval for the serum profiles, whereas we used overnight collection with 15 minute blood sampling. The relationship between urinary growth hormone excretion and plasma growth hormone concentrations may not be constant throughout the 24 hours.

Moreover, Crowne et al reported urinary growth hormone excretion in relation to urinary creatinine excretion. Whereas this convention may be useful for checking the completeness of overnight urine collections, in this particular case it can be very misleading. We have examined overnight urine samples from 151 normal adolescents at different stages of puberty, and demonstrated that the urinary excretion of creatinine increases during puberty (see table). If urinary growth hormone excretion rates are expressed as a ratio of creatinine excretion therefore, it will be difficult to discern any increase of excretion of growth hormone during puberty, and any correlation which exists with plasma growth hormone concentrations will be lost. If a small group is studied over a limited range of pubertal stages, this change in creatinine excretion would not be so significant, and indeed Crowne et al did present some data to support this position. In the subgroups of prepubertal children and in the group of six boys in early puberty, significant correlations were seen between urinary growth hormone excretion related to creatinine and mean serum growth hormone concentrations (r=0.82 and n=17; r=0.74 and n=17).1

We believe that a note of caution should be added to the use of urinary creatinine ratios during puberty, and suggest that urinary growth hormone excretion should be expressed as a timed excretion rate without reference to creatinine. In our experience this does reflect overnight mean plasma growth hormone concentrations with some accuracy during normal puberty.

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Mean (SEM) overnight urinary creatinine excretion (μmoles per mg creatinine) in normal adolescents. Figures in squared brackets indicate numbers of subjects at each puberty stage

<table>
<thead>
<tr>
<th>Puberty stage</th>
<th>Boys</th>
<th>Girls</th>
<th>Combined</th>
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<tbody>
<tr>
<td>0-21 (0-02)</td>
<td>0.22 (0.03)</td>
<td>0.21 (0.02)</td>
<td>0.21 (0.02)</td>
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<tr>
<td>26-29 (0-02)</td>
<td>0.26 (0.03)</td>
<td>0.26 (0.02)</td>
<td>0.26 (0.02)</td>
</tr>
<tr>
<td>30-42 (0-03)</td>
<td>0.30 (0.03)</td>
<td>0.30 (0.03)</td>
<td>0.30 (0.03)</td>
</tr>
<tr>
<td>44-47 (0-04)</td>
<td>0.44 (0.05)</td>
<td>0.44 (0.04)</td>
<td>0.44 (0.04)</td>
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<tr>
<td>59-70 (0-06)</td>
<td>0.59 (0.05)</td>
<td>0.59 (0.04)</td>
<td>0.59 (0.04)</td>
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Malnutrition in children with cancer

Sir,—In their report of energy intake and basal metabolic rate in children with malignant disease receiving maintenance chemotherapy, Bond et al4 refer to our work exploring the incidence of malnutrition in children with cancer.5 They state that we found nutritional status to be generally adequate at diagnosis but to deteriorate as a result of treatment. In fact we found that nutritional status was frequently inadequate at diagnosis. This finding directly contrasts with nearly all other studies. Our 48 study of newly diagnosed children with malignant solid tumours showed a marked discrepancy in the incidence of malnutrition assessed by conventional means when compared with arm anthropometry. Using conventional indices of weight for height and weight for age (as used by Bond et al themselves) only 7% of our patients were identified as malnourished. These conclusions were confirmed in a larger series of 100 newly diagnosed patients from our own institution using the same techniques. 

Malnutrition was more frequent when compared with arm anthropometry than when compared with the conventional indices. Our findings support the view that children with malignancy and severe malnutrition are more likely to be malnourished during chemotherapy (35%) than those with leukaemia (15%) or extra-abdominal solid tumours (7%). It is evident that the presence of a large tumour load in a young child (with or without ascites or pleural effusion) may affect both weight and height for age, making this an unreliable index of nutritional status at diagnosis.

Neonatal BCG immunisation

Sir,—The annotation by Clarke and Rudd was a very helpful review of neonatal BCG immunisation.6 However the technical difficulty of intradermal injections in newborn infants was not mentioned, although poor technique is likely to result in inadequate immunisation or avoidable local side effects.

The percutaneous multiple puncture technique, described over 30 years ago,7 appears to be both safe and effective.8 The multiple puncture technique requires a more concentrated vaccine, suspended in dextran, and an adapted Heaf gun with a 20 G needle head. Any risk of the transmission of infection can be eliminated by the use of disposable magnetic heads for the Heaf gun.

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