Tubular dysfunction and microalbuminuria in insulin dependent diabetes

Sir,

In a recent paper by Walton et al investigating tubular function in diabetes, urinary α-1-microglobulin excretion was found to be significantly higher in diabetic children compared with controls.1 Using an enzyme immunoassay (Imzyne α-M, Fujirebio Inc) we obtained similar results.2

In 62 type 1 diabetics (38 girls), aged 3 to 21 years, with duration of disease from one week to 13 years, urinary α-1-microglobulin excretion was evaluated prospectively every three months for one year; 54 healthy subjects (32 girls), aged 4 to 21 years served as controls. Diabetics were divided into three groups according to their duration of disease (group A: less than five years; group B: five to 10 years; group C: more than 10 years); during the study 28 poorly controlled children (with stable glycated haemoglobin (HbA1c) concentration >10%) improved their metabolic control and after 12 months HbA1c concentrations were less than 8%. In diabetics urinary excretion of α-1-microglobulin was significantly higher than in controls, particularly in group C patients. In agreement with Dr Walton's study, a significant correlation was found between HbA1c values and urinary α-1-microglobulin excretion as well as between 24 hour glycosuria and urinary excretion of α-1-microglobulin. In poorly controlled diabetics with duration of disease shorter than 10 years (group A and B) urinary α-1-microglobulin excretion returned to normal when metabolic control improved, while it remained high in children with duration of diabetes longer than 10 years (group C) (table). Albumin excretion rate was less than 15 μg/minute in all diabetic children during the study.

Our data confirm that glycaemic control influences urinary excretion of α-1-microglobulin; however, despite good metabolic control, children with long duration of diabetes and without microalbuminuria show an increased excretion of α-1-microglobulin.

Although diabetic kidney disease is primarily a glomerulopathy,3 we believe that impaired tubular function is detectable earlier than glomerular damage.

References

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Bulging fontanelles in infants without meningitis

Sir,

We read with interest the article by Mann et al on transient intracranial hypertension of infancy.1 We submitted a similar report to this journal in 1986 that was not accepted for publication in competition with other papers coming through at that time.

Over a six year period, seven infants (see table) were admitted to the Royal Alexandra Hospital for Sick Children, Brighton, with bulging fontanelles and fever. Examination of the cerebrospinal fluid and blood cultures was normal in each case. All seven were previously healthy, but case 4 had Poland’s anomaly. Cerebrospinal fluid pressure was raised in the three infants who had the investigation performed. All the infants' fontanelles had returned to normal within 72 hours. We believe all our patients were suffering from viral infections, but the relevant investigations were not complete. A history of mild head injury was obtained in case 3. In two of our cases the bulging fontanelles returned in the presence of further infections. The mother of case 4 brought her daughter back

### Table

<table>
<thead>
<tr>
<th>Urinary α-1-microglobulin excretion (mg/ml mmol creatinine) in 28 poorly controlled diabetic children and in 54 normal children</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>During poor glycaemic control (stable HbA1c &gt;10%)</strong></td>
</tr>
<tr>
<td>Diabetic children:</td>
</tr>
<tr>
<td>Group A (n=9)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Group B (n=10)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Group C (n=9)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Normal children</td>
</tr>
</tbody>
</table>

*p<0.001 compared with normal children.
to the hospital twice with recurrences of her bulging fontanelle, and at a later date admitted that her fontanelle became distended whenever she developed a cold.

There have been few other reports of this phenomenon. Amacher and Spence reported on a 15 month old boy with similar findings in a review of 23 cases of benign intracranial hypertension in childhood and adolescence.\(^2\) Of those under 12 years, 50% had a viral aetiology, and over half did not have papilloedema. Papilloedema was not seen in any of our cases. The normal computed tomography and ultrasound results were in keeping with the diagnosis. All the scans by Amacher and Spence were normal, save for two in whom the ventricles were small. The patients in our series remained surprisingly well. Apart from the two who had gastroenteritis, only two of the remaining five were vomiting. In addition to the infants in this report, three others have been seen with bulging fontanelles after respiratory infections. Lumbar punctures were not performed as the infants were recovering when seen. It is tempting to speculate that the fontanelle acts as a ‘safety valve’. Perhaps the phenomenon has been under recognised because infants have fewer symptoms associated with raised intracranial pressure than adults who have rigid vaults.

The Family Fund

Sir,

Paediatricians have supplied reports to the Family Fund for many years in support of families of severely disabled children. About 105 000 families have benefited since 1973.\(^3\) Washing machines, dryers, and holiday relief are the most needed and the present budget is £8 million of government money.

Recently the Fund has been unable to help the parents of two of my patients (the only children of the family). They are severely mentally retarded, undiagnosed with marked involuntary movements, have very little independent mobility, and severely limited communication at the ages of 5 and 7 years. The Fund accepts that the children’s disabilities come within its medical criteria but is unable to offer the family help on the grounds that their economic circumstances do not justify it.

The Fund reports that only 0-9% of families have been refused help on the grounds that ‘they are too wealthy’ for the purposes of the Fund. It also accepts that parents who are denied on these grounds feel angry, and observes that all families tend to live up to the edge of their income: ‘Relatively well off families have understandably high expectation in material and personal terms so that the stress they experience can be no less acute than that experienced in less favourable circumstances’.\(^2\) The Fund stresses that it does not operate a means test but justifies each grant individually. It comments on its sensitivity to the exceptional expense of having more than one handicapped child, or unusual expenses because of particular disabilities.

The Family Fund grew out of the appreciation of the cost of caring for disabled children after the thalidomide tragedy,\(^4\) and it is accepted that low income families should have greatest priority.

If my patients’ families were ‘wealthy’ in the ordinary sense of the term, this letter would not have been written. ‘Too wealthy’ is a threshold under regular review but seems to be around a gross income of £12 500 per annum.

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**Correspondence**

**Table** Details of infants with bulging fontanelles

<table>
<thead>
<tr>
<th>Case No</th>
<th>Sex</th>
<th>Age (months)</th>
<th>Symptoms</th>
<th>Cerebrospinal fluid pressure (cm H(_2)O)(^*)</th>
<th>Cerebral imaging</th>
<th>No of recurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>5</td>
<td>Upper respiratory tract infection</td>
<td>Not done</td>
<td>Not done</td>
<td>—</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>4</td>
<td>Upper respiratory tract infection</td>
<td>30-32</td>
<td>Computed tomogram, normal</td>
<td>—</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>9</td>
<td>Upper respiratory tract infection</td>
<td>30</td>
<td>Ultrasound normal</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>F</td>
<td>4</td>
<td>Gastroenteritis (Echo 18 virus)</td>
<td>16</td>
<td>Ultrasound normal</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>M</td>
<td>5</td>
<td>Febrile, rash over shoulders</td>
<td>Not done</td>
<td>Not done</td>
<td>—</td>
</tr>
<tr>
<td>6</td>
<td>M</td>
<td>4</td>
<td>Gastroenteritis</td>
<td>Not done</td>
<td>Not done</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>F</td>
<td>2</td>
<td>Upper respiratory tract infection</td>
<td>Not done</td>
<td>Not done</td>
<td>—</td>
</tr>
</tbody>
</table>

\(^*\)Normal range for infants 4-15 cm H\(_2\)O.\(^3\)

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References


W Barry, W Lenney, and G Hatcher
Royal Alexandra Hospital for Sick Children, Dyke Road, Brighton BN1 3JN
Bulging fontanelles in infants without meningitis.

W Barry, W Lenney and G Hatcher

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