Microalbuminuria in type 1 diabetes – Audit of management of children and adolescents in a single diabetes centre

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Background
There are international guidelines on screening for Microalbuminuria (MA) in children with Type 1 Diabetes Mellitus (T1DM). But the National Paediatric Diabetic Audit, UK suggests that screening is missed in over 50% of cases. Further, there is little data on the management and natural course of MA in children by frontline units.

Objective
To describe the prevalence, management and natural course of MA in children and adolescents with T1DM.

Methods
All patients with T1DM noted to have MA between April 2013 and April 2015 were included in the study. Data on demographic factors and laboratory results at onset of MA and during the study period was collected retrospectively from electronic records and databases. MA was diagnosed by Albumin Creatinine Ratio (ACR) of more than 3 mg/mol on a random urine sample.

Results
77 out of 185 (9.3%) children with T1DM were noted to have MA during the study period. The characteristics are summarised in table and fig 1, 2 and 3.

<table>
<thead>
<tr>
<th>n</th>
<th>age in years</th>
<th>Mean HbA1C (mmol/mol)</th>
<th>Mean BM(kg/m2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA1</td>
<td>17</td>
<td>13.8±3.1</td>
<td>6.7-18.5</td>
</tr>
<tr>
<td>MA2</td>
<td>11</td>
<td>14.7±2.3</td>
<td>10.7-18.9</td>
</tr>
<tr>
<td>MA3</td>
<td>5</td>
<td>15.1±1.55</td>
<td>13.0-16.8</td>
</tr>
<tr>
<td>MA4</td>
<td>4</td>
<td>17.1±1.5</td>
<td>4.1-16.7</td>
</tr>
<tr>
<td>MA5</td>
<td>4</td>
<td>17.1±1.25</td>
<td>15.9-18.9</td>
</tr>
<tr>
<td>MA6</td>
<td>1</td>
<td>17.8</td>
<td>80.3</td>
</tr>
</tbody>
</table>

Mean duration from diagnosis of TIDM to MA was 5.9 years (0.8-15.6).
ACR normalised in 8 (50%) at a mean follow up of 4.3 years, was intermittent in 3 (16.7%) and persisted in 5 (27.8%). Fig 3.
Outcome according to age and duration of diabetes is summarised in fig 4 and 5.
Of those which resolved the mean duration from diagnosis to disappearance was 2.65 years.
Frequency of retesting varied between 4 months to 3 years.
One third achieved an HbA1C <58.5 mmol/mol.
No one developed macroalbuminuria, or required treatment.
No one had hypertension or significant lipid abnormalities.

Conclusions
A significant proportion of patients presented with MA outside recommended screening criteria (>12 years and >5 years duration). A significant proportion also had good glycemic control. MA either resolved or was non-progressive in the vast majority of patients.

References
NICE guidelines. Diabetes (type 1 and type 2) in children and young people: diagnosis and management. Published August 2015.

Fig 1. Age of presentation of MA
Fig 2. Duration of diabetes before MA
Fig 3. Evolution of MA
Fig 4. Evolution of MA according to duration of
Fig 5. Evolution according to age of onset of MA