Hematuria as First Sign of Presentation in Urolithiasis

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INTRODUCTION

Urolithiasis may cause macroscopic or microscopic hematuria as a clinical sign in both children and adults,[1,2] it may also be a cause of hematuria in absence of pain. Hematuria has multiple differential diagnosis including neoplasia, infection, lithiasis, as well as glomerular and interstitial renal parenchymal disease [3]. NurAzil et al find hematuria as first sign in 42.1% of children that consulted with renal stone disease [4]. Two previous reports describe children with idiopathic hypercalciuria in whom painless hematuria preceded calcium oxalate stone formation by one to six years [5,6]. A report of the Southwest pediatric nephrology study group describe in 76 children with hypercalciuria (≥ 4 mg/Kg/day), 33 (43.4%) with gross hematuria, calcium oxalate crystalluria, a family history of urolithiasis and/or a family history of hematuria. They also find eight of 60 children (6 boys, 2 girls) with untreated hypercalciuria developed urolithiasis or renal colic during the one to four year follow-up period [7]. In addition to hypercalciuria, hypocitraturia and hyperuricosuria are acknowledged as causes of hematuria and urolithiasis in children [5]. In adults with asymptomatic hematuria, Marumo et al, find by ultrasonography 21.5% of urolithiasis [8]. Large renal pelvic stones in adults may show hematuria, infection or loss of renal function rather than colic, symptoms in children can be similar, and hematuria may be a unique manifestation, as well as generalized abdominal pain or urinary tract infection [9].

Our aim is to evaluate the presence of macro or microhematuria as first sign of kidney stone disease in both children and adults.

MATERIAL AND METHODS

This is an observational study prospective and retrospective that selected from clinical reports two consecutive populations of stone formers, 245 children and 245 adults from 2003 to 2015 to evaluate the frequency of macro or microhematuria as first sign. Urolithiasis was confirmed by X-ray, ultrasound or tomographic scans, or by spontaneous or surgically elimination of the stone. Macrohematuria is characterized by the massive presence of red blood cells in the urine, leading the latter to acquire a clearly discernable red-brownish color, while microhematuria can only be observed by dipstick or microscopic examination. Microhematuria was defined in children as five to more red blood cells per high power field in a centrifuged urine sample determined on at least two occasions and in adults three or more red blood cells per high power field. As exclusion criteria we considered the presence of renal colic previous to hematuria detection or simultaneously present, positive urinary tract infection, hematuria caused by stone elimination or urolologic procedure. We also excluded menses, any cause of trauma, exercise, and sexual activity, tumoral or glomerular and interstitial renal parenchymal pathology. Creatinine clearance was above 60 ml/min/1.73m². Most of them have their 24 hour urine biochemical diagnosis evaluation for urolithiasis but these...
are not considered for this communication. Informed consent was obtained from all individual participants adults and parents of children included in the study. Statistical data were generated with a commercially available software package.

RESULTS

Table (1) shows demographic characteristics, renal function and presence of macro and microhematuria in the total group of children and adults. From 245 children kidney stone formers (2 to 16 years old), 133 were male (M) mean age 11 ± 3.9 and 112 women (W), mean age 11 ± 3.8, (1.19:1). Girls kidney stone formers n=112, 17 (15.2%) had hematuria as first sign, 12 microhematuria and 5 macrohematuria and in 133 boys 24 (18%) had hematuria as first sign, 18 microhematuria y 6 gross or macrohematuria.

<table>
<thead>
<tr>
<th>Kidney Stone Formers</th>
<th>Children (n=245)</th>
<th>Adults (n=245)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex (M/W)</td>
<td>133/112</td>
<td>125/120</td>
</tr>
<tr>
<td>Age (years of age)</td>
<td>11 ± 3.9</td>
<td>44.4 ± 14</td>
</tr>
<tr>
<td>Height (m)</td>
<td>1.46 ± 0.19</td>
<td>1.67 ± 9.7</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>43.6 ± 16</td>
<td>72 ± 16</td>
</tr>
<tr>
<td>BMI (kg/height²)</td>
<td>19.6 ± 1.4</td>
<td>25.7 ± 4.6</td>
</tr>
<tr>
<td>Cl Cr ml/min/1.73m²</td>
<td>127 ± 42</td>
<td>116 ± 17</td>
</tr>
<tr>
<td>Hematuria (%)</td>
<td>17.1</td>
<td>14.3</td>
</tr>
<tr>
<td>Microhematuria (%)</td>
<td>71</td>
<td>68.6</td>
</tr>
<tr>
<td>Macromhematuria (%)</td>
<td>29</td>
<td>31.4</td>
</tr>
</tbody>
</table>

In conclusion macro or microhematuria as first sign of presentation must warn urologists and the medical community to rule out urolithiasis among other conditions in both children and adults.

REFERENCES