Introduction

Urolithiasis is a widespread disease and represents the most frequent cause of hospitalisation within the urological field in western countries [1,2]. The prevalence of nephrolithiasis varies between 5 and 10% and the yearly incidence is about 0.1-6% in the world population [3].

Over the last 20 years the management of this disease has changed radically. The medical therapy has experienced an evolving role in urolithiasis treatment by correcting lithogenous processes and active expulsion of the stone [4-6].

Nowadays, among new litholytic drugs, there is a phytotherapeutical agent such as the aqueous extract of Phyllantus niruri (Pn) [7].

Pn is a plant belonging to the Euphorbiaceae family, which is so widely distributed, both in many tropical and subtropical countries, and it is generally used in Brazilian folk medicine for the treatment of urolithiasis [8]. Moreover Pn shows antispasmodic and relaxants effects on many contractile tissue.

These effects might also occur in urethral smooth muscle and might contribute to the elimination of smaller calculi [9].

The aim of the study was to evaluate the efficacy of new therapeutic protocols in a youth population affected by nephrolithiasis.
The formation of kidney stones is a relatively complex process [10–12]. Generally, urine contains a certain amount of chemical agents that take part to crystal formation or precipitation. The balance among inhibitors and promoters prevents the formation of kidney stones [3,18]. New therapeutic aids include the use of phytotherapy agents such as Pn [7,19].

In our study we report the results of a Pn therapy in 20 patients suffering from nephrolithiasis. Compared to the control group, these patients have shown a higher complete lithiasis clearance (stone-free) percentage.

Several authors have investigated the Pn mechanism of action. Some authors described the Pn powerful inhibitory effect on CaOX crystal adhesion and suggested that Pn intake may reduce urinary calcium in patients with hypercalciuria [19,20]. On the other hands, Freitas et al suggested that this effect was related to a higher incorporation of glycosaminoglycans into the stone, independently from urinary excretion of citrate and magnesium. In fact the calculi from Pn treated group

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Treated group</th>
<th>Control group</th>
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<tbody>
<tr>
<td>Demographics:</td>
<td></td>
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<tr>
<td>N° patients</td>
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<td>20</td>
</tr>
<tr>
<td>Mean years age</td>
<td>23</td>
<td>20</td>
</tr>
<tr>
<td>Sex (female: male)</td>
<td>12 : 8</td>
<td>12 : 8</td>
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<tr>
<td>Stone Characteristics:</td>
<td></td>
<td></td>
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<tr>
<td>Average stone size</td>
<td>8 mm</td>
<td>7.41 mm</td>
</tr>
<tr>
<td>Therapy:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pn therapy</td>
<td>n. 20</td>
<td>n. 0</td>
</tr>
<tr>
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<td>all patients</td>
<td>all patients</td>
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<tr>
<td>High fluid intake</td>
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<td>all patients</td>
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Table 1: Clinical features.

**Discussion**

The formation of kidney stones is a relatively complex process [10–12]. Generally, urine contains a certain amount of chemical agents that take part to crystal formation or precipitation. The balance among inhibitors and promoters prevents the formation of kidney stones [3,18]. New therapeutic aids include the use of phytotherapy agents such as Pn [7,19].
had a higher content of GAGs, suggesting that Pn reduces the deposition of crystalline particles [10,20].

Moreover our findings have also highlighted a significant reduction in the concentration of urinary calcium in 10 patients with hypercalciuria after Pn therapy. Indeed, previous studies have assessed that Pn significantly reduces calcium urinary excretion in stone-forming patients, maybe through the significant reduction in CaOx endocytosis consequent to increase in cytosolic calcium in renal epithelial cells or extracellular sources [19-21]. Thus Pn might prevent the internalization of CaOx crystals by changes in calcium metabolism. Instead, no control arm patient showed improvement in hypercalciuria.

Although the evidence is encouraging, the mechanism action of Pn is not totally understood. According to our experience, the drug can be a non-toxic, low-cost and effective alternative to treatment and/or prevention of urolithiasis.

Further studies are likely to provide additional confirmation of Pn efficacy in medical therapy for stone disease.

References


