



## Case Report

# The treatment of childhood progressive bilateral multiple renal stone disease: A role of essential oil terpenes

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## Abstract

**Background:** The association of childhood urolithiasis with idiopathic hypercalciuria plus idiopathic hyperuricosuria has been infrequently reported in children. Treatments of childhood urolithiasis include treatment of the underlying metabolic, and the use of essential oil preparations of terpenic which contains pinene (31%), camphene (15%), borneol (10%), anethol (4%), fenchone (4%) and cineol (3%), which have been used with important benefits. Urinex (Pharco Co.) is the essential oil preparations mostly available in the Middle East. The aim of this paper is to emphasize the possible adjunctive role of essential oil preparations of terpenic in the management of serious childhood urolithiasis.

**Patients and methods:** The occurrence of childhood urolithiasis with idiopathic hypercalciuria plus idiopathic hyperuricosuria is reported in a young child and the conservative treatment is described with emphasis on the role of essential oil terpenes in the treatment of urolithiasis.

**Results:** Three years and 4months old girl with urolithiasis associated with idiopathic hypercalciuria plus idiopathic hyperuricosuria presented with recurrent abdominal pain without hematuria, and was treated for about four months with triple therapy consisting of oral hypocalciuric diuretic hydrochlorothiazide and amiloride HCl as half tablet of Moduretic (Merck & Co.; hydrochlorothiazide 25mg and amiloride 2.5mg) daily, oral allopurinol 50mg daily, and an essential oil terpene capsule (two capsule twice daily). The effect of treatment on urolithiasis was studied by monthly ultrasound examination which showed significant improvement.

**Conclusion:** This study showed that essential oil terpenes can have important therapeutic benefits in the treatment of childhood urolithiasis associated with hypercalciuria plus hyperuricosuria.

## Introduction

Treatments for childhood urolithiasis are generally preventive, and chemical dissolution has its limitations. Therefore, open surgery is still required in childhood lithiasis. With lithotripsy, repeated sessions are often required, and urethral stent may be required, and there are concerns that the shock wave can cause renal damage. Treatments of the underlying metabolic abnormalities associated with childhood urolithiasis include anticalciuric diuretics such as thiazides and amiloride in the case of hypercalciuria, pyridoxine to inhibit calcium oxalate aggregation, and urinary crystallization inhibitors such as magnesium, citrate and phosphate in cases of hyperoxaluria, and allopurinol in cases of hyperuricosuria.

Essential oil preparations of terpenic which contains pinene (31%), camphene (15%), borneol (10%), anethol (4%), fenchone (4%) and cineol (3%), have been used in childhood urolithiasis with important benefits. Urinex (Pharco Co.) is the essential oil preparations mostly available in the Middle East [1-6].

The association of childhood urolithiasis with idiopathic hypercalciuria plus idiopathic hyperuricosuria has been infrequently reported in children [2].

## Patients and methods

The occurrence of childhood urolithiasis with idiopathic hypercalciuria plus idiopathic hyperuricosuria is reported in a young child and the conservative treatment is described with



emphasis on the role of essential oil terpenes in the treatment of urolithiasis.

## Results

Three years and 4 months old girl presented with recurrent abdominal pain without hematuria. Her weight was 15kg and her height was 98cm. Two ultrasound examinations demonstrated a progressive bilateral multiple renal stone disease (Table 1). There was no family history of significant renal stone diseases. Laboratory tests: Serum creatinine 0.9mg/dl, blood urea 30mg/dl, serum calcium 9.4mg/dl (Normal: 9-11mg/dl), serum phosphorus, 4.3mg/dl, and serum uric acid 5.8mg/dl. 24hour urine examination (volume 720ml): Calcium 83.5mg/24hr [5.6mg/kg/24hr], Oxalate 27mg/24hr (Upper limit 45mg/24hr), Uric acid 1.7g/24hr (Upper limit 1g/24hr), and creatinine 123mg/24 hr.

Sodium nitroprusside test for cystine was negative, and paper chromatography for cystine was also negative.

The girl was treated for about four months with aggressive triple therapy with aim of preventing renal damaged which was considered to be the logic ultimate outcome as suggested by the serious nature of the condition. Treatment consisted of oral hypocalciuric diuretic hydrochlorothiazide and amiloride HCl as half tablet of Moduretic (Merck & Co.; hydrochlorothiazide 25mg and amiloride 2.5mg) daily, oral allopurinol 50mg daily, and an essential oil terpene capsule (two capsule twice daily).

The protocol for this research was approved by the scientific committee of Iraq headquarter of Copernicus Scientists International Panel and conforms to the provisions laid out in the Declaration of Helsinki (as revised in Edinburgh 2000).

The effect of treatment on urolithiasis was studied by monthly ultrasound examination which showed significant improvement (Table 1). No side effect was observed during treatment.

## Discussion

Pediatric urolithiasis is commonly caused by metabolic disorders that are associated with recurrence and/or the

progression to nephrocalcinosis [5,6]. Surgical methods and lithotripsy have no effect on these underlying metabolic disorders and not effective in preventing the recurrence of stone disease or the progression to nephrocalcinosis and renal damage [1-4].

We have previously reported a beneficial effect of essential oil preparations of terpenic in the treatment of six patients (5males and ifemale) with ultrasonographically proven renal or uretral stones. Four of the treated children had hypercalciuria and two each had hyperoxaluria and distal renal tubular acidosis. The ages of the patients were from 10 months to 5years. They also received treatments for the underlying metabolic abnormalities, such as hypocalciuric diuretics for hypercalciuria. They patients were treated for a period ranging from 10 days to 12weeks. All the patients achieved a stone-free state without the occurrence of any adverse effects [1].

We have also reported the treatment of infantile idiopathic hyperuricosuria and idiopathic hypercalciuria causing infantile renal stone disease with the use of essential oil preparations of terpenic The 8.5months old boy with bilateral multiple stone disease was treated with triple therapy consisting of hypocalciuric diuretics, allopurinol and essential oil terpenes with the aim of achieving a stone-free state and preventing renal damage. Treatment was associated with early symptomatic relief during the first week of therapy, and stone-free state was achieved after 3months of treatment without the occurrence of any side effects [2].

The useful role of essential oil terpenes in the dissolution of urolithiasis is possibly attributed to the inhibitory effect resulting from terpene-induced renal hyperemia, as the protective effect of such hyperemia has been shown in animals experimental studies [3,7].

## Conclusion

This study showed that essential oil terpenes can have important therapeutic benefits in the treatment of childhood urolithiasis associated with hypercalciuria plus hyperuricosuria.

**Table 1:** The findings of ultrasound examinations before and during treatment.

Date	Right kidney	Left kidney	Notes
1 month before the start of therapy	5mm stone in the lower pole.	6mm stone in the lower pole.	No hydronephrosis
On referral before the start of therapy	6mm stone in the lower pole. 6mm stone in the middle pole.	6mm stone in the lower pole. 10mm stone in the pelviuretric junction.	Mild hydronephrosis Progressive bilateral multiple renal stone disease
One month after treatment	4mm stone in the lower pole. 5mm stone in the middle pole.	6mm stone in the lower pole. 10mm stone in the pelviuretric junction.	Progression stopped
Thee months after the start of treatment	5mm stone in the middle calyx.	7mm stone in the pelviuretric junction.	Minimal dilatation 24hour urine: Calcium 18.5mg/24hr, Uric acid 420m g/24hr.
Four months after the start of treatment	No stone	5mm stone in the pelviuretric junction.	Minimal dilatation



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