

## A Prospective Clinical And Ultrasonic Assessment Of Urinary Litholytic Activity Of Cynodon Dactylon Aqueous Extract

دراسة تاثير فاعلية المستخلص المائي لنبات النجيل في اذابة حصى المجاري البولية

**Karrar Kamoona:** PharmacyB, Msc in Pharmacology and Therapeutics/ Kufa university college of pharmacy

**Fadhid Abdul Jabbar:** PharmacyB (PB), Msc in Pharmacology and Therapeutics Kufa university college of pharmacy

**Sahar A Majeed;** MB,ChB, Msc in Pharmacology and Therapeutics/ kufa university medical college department of pharmacology and therapeutics

**Hussein Abdul Kadhim;** MB. ChB, Msc and PhD in Pharmacology and Therapeutics/ kufa university medical college department of pharmacology and therapeutics

**Dr- alhar @ yahoo.com**

### الخلاصة:

**خلفية البحث:** حصى المجاري البولية هي احدى المشاكل الصحية المألوفة التي تشكل خطرا على الوظائف الكلوية نتيجة لاحتمالية انسداد الحالب وارتجاع الادراج وحدوث الالتهاب والضرر الكلوي

**الهدف:**الهدف من هذه الدراسة هو تحديد فاعلية المستخلص المائي لنبات النجيل في اذابة حصى المجاري البولية بلمقارنه مع الادويه القياسيه.  
**المنهجية:** كمحاولة لتعزيد فعالية العلاجات الحالية والمنزلة لحصى الحالب تم تقييم عشرين مريض مصاب بحصى اسفل الحالب الموضحة بالسونار وقد تم تقسيم المرضى الى مجموعتين متساويتين الاولى هي المجموعة القياسية تعطى الاموكسيسيلين مع البايكاربونات والدايكلوفيناك والثانية هي مجموعة اختبارية تاخذ مع العلاج المذكور المستخلص المائي لنبات النجيل مع المراقبة السريرية والفحص بالسونار.

**النتائج:**اوضحت النتائج ان ٩٠% من المرضى الذين ياخذون مستخلص النجيل قد اختفت عنهم الاعراض السريرية مع النتيجة السلبية لفحص الحصى بالسونار (فضلا عن الملاحظة المباشرة لنزول الحصى عند بعض المرضى) بالمقارنة مع ٧٠% فقط من اختفاء الاعراض وسلبية السونار في المجموعة القياسية. وتلك نتيجة معتد بها احصائيا بفحص  $X^2$  عند  $P < 0.05$ .

**الاستنتاج:** من عموم النتائج فقد اظهر مستخلص نبات النجيل المائي تحسنا سريريا وبناتج السونار في سير حصى الحالب  
**التوصيات:**البحث بحاجة للمزيد من التقييم على عينه اكبر من مرضى حصى المجاري البولية للتقييم الادق لفاعلية النجيل

### Abstract:

**Back ground:** Urolithiasis is one of the common health problems which endanger renal function due to ureteral obstruction and hydronephrosis.

**Aim of the study:** to assess activity of C.dactylon in dissolving urinary stone in comparism with stander drugs.

**Material and methods:**As atrial of augmenting litholytic activity of the commonly used drugs a 20 male patients were divided into two equil groups one is control and taking amoxicillin, bicarbonate and diclofenac the second one is test group taking extract of Cynodon dactylon in addition to these agents. All patients monitored with clinical and ultrasonic findings.

**Result:** The results showed that 90% improvement in clinical and ultrasonic parameters noticed in test group in comparison with only 70% improvement in control group. This was statistically significant by chi square test at  $P < 0.05$ .

**Conclusion:** The aqueous extract of C. dactylon showed a significant improvement in prognosis of lower ureteric stones based on clinical and ultrasound findings.

**Recommendation:**further follow up of larger test samles of patients with lower ureteric stones is mandatory for accurate evaluation of litholytic activity of C.dactylon.

**Keywords:** ureteric stone, Cynodon dactylon, polyfructosan,ureteric stone.

## INTRODUCTION

Urolithiasis is a common health problem which could be impending postrenal cause of renal dysfunction. This disorder could be attributed to different precipitating causes including hereditary, dietary, anatomical and climatic factors (1). Spontaneous passage of renal and ureteric stones depends on the size and site of these stones. However waiting of a urinary tract stone for spontaneous descending is a dangerous option since ureteric obstruction can cause hydronephrosis, renal dysfunctions, infections and hematuria within the first two to four weeks. So that medical intervention is a mandatory decision while ureteroscopic and surgical interventions are spared for highly located, larger size and critical calculi (2). Urine alkalinizing agents like bicarbonate, antimicrobials, anti-inflammatory and ureteric dilators like tamsulosin are common medical measures taken within first week of the acute attack of ureteric colic due to stone. However many other medical natural products are candidate to have a potential mechanism to improve conditions of renal calculi. Phytochemicals like glycosides and polysaccharides are well known for their diuretic (3)(4), antimicrobial (6) and anti-inflammatory effects like polyfructosan (triticin)(7) that is present as a phytochemical byproduct in Graminae plant family especially in *Cynodon dactylon*.

## MATERIALS AND METHODS

Twenty male patients aging 25-50 years with body weight average 60-100 kg. All of them had clinical presentation of repeated attacks of renal colic and dysuria. All patients showed ultrasonic finding of lower ureteric stone measuring 4-5 mm in transverse diameter and 5-15 mm in longitudinal diameter. They had positive urate crystals during GUE. None of them showed ultrasonic finding of hydronephrosis, complete ureteric obstruction or renal and pelicalycial dystrophy. The clinical and ultrasonic data was collected discretely over 3 years from follow up of a relative out patients. Sex bias selection was for more ease of accessibility and compliance during monitoring period.

Patients were divided into two groups:

A- Control standard treated group (N = 10). They were given oral treatment with 500 mg amoxicillin (capsule, UAE) tid plus sodium bicarbonate (with citrate as Urical, Iraq) twice daily plus oral diclofenac 50 mg (tablet, Indian). The treatment course continued for one week duration. Symptoms were daily monitored during this week and a one week later.

B- Test group (N = 10). They have the same treatment schedule as group A with addition

of 750 ml of aqueous extract of *Cynodon dactylon* (0.1%) divided into twice oral dose daily for one week.

All patients (whether those who noticed passage of the stone or not) were requested to repeat ultrasonic examination after the 7<sup>th</sup> day of treatment.

Preparation of 0.01% of *Cynodon dactylon* aqueous extract

Standard aqueous extract preparation is done by macerating 100 g of the dried areal part of *C. dactylon* (leaves and transverse legs). One liter of distilled water prepared for dissolving the powdered plant part. A mechanical stirrer with thermostat achieves efficient mixing of the raw

material over upto 6 hours with heating within 60 C. after that repeated filtering and drying within the oven for calculating exact molar of solution.

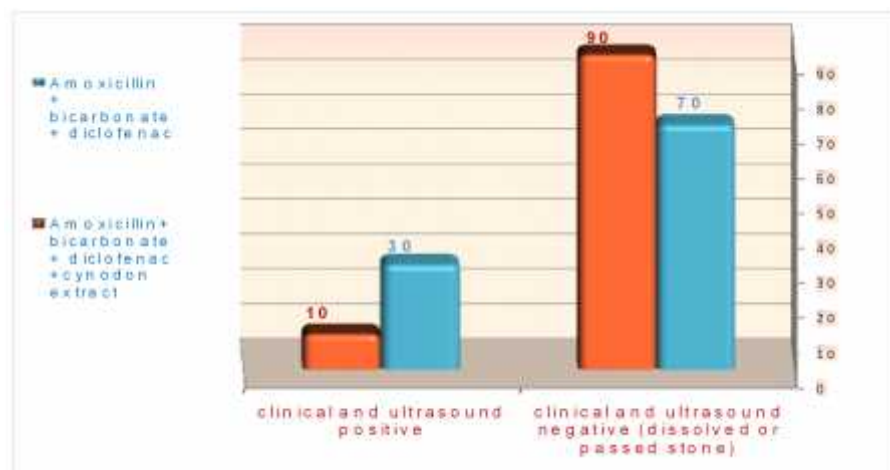
## RESULTS:

1- The clinical assessment involved monitoring of the presence of one or more of the following manifestations at the end day of treatment course

- 1- Loin dullness (unilateral or bilateral with or without radiation to groin region)
- 2- Attacks of intermittent colicky abdominal pain (with or without reflex vomiting).
- 3- Presence of dysuria (with or without fever and shivering)

**Table (1) The end course clinical findings of 10 patients with ureteric stone treated with an aqueous extract of *C. dactylon* in combination with amoxicillin, bicarbonate and diclofenac in comparison with the control group N =10.**

Patient group	Percentage of +ve manifestations	Percentage of –ve manifestations	P value
Control (treated amoxicillin + Na bicarbonate + diclofenac)	40 ( N =4)	60 ( N =6)	<0.05
Test group (treated with amoxicillin + Na bicarbonate + diclofenac + <i>C dactylon</i> )	10 ( N =1)	90 ( N =9)	< 0.05



## 2- Ultrasonic findings:

Figure (2) percentages of patients (out of N = 10) who encounter dissolved or passed lower ureteric stones with improvement in clinical and ultrasonic parameters. Test group patients were given

extract of *C. dactylon* in addition to the same drugs regimen given to the control group which includes amoxicillin, sodium bicarbonate and diclofenac daily over first 7 days from onset of first attack of ureteric colic.

Chi square test was done at  $P < 0.05$  and showed a significant difference in improvement parameters between *C. dactylon* treated and control group.

## **DISCUSSION**

Medical treatment rather than ureteroscopic, ultrasonic or surgical treatment of ureteric and renal calculi sometimes become of choice. Different conditions of urolithiasis are considered to be candidate for medical treatment. These conditions include patients who are unfit for invasive treatment or lithotripsy or conditions in which definite surgical interventions are not feasible. Trial period of medical treatment during the first one week after the first attack of acute ureteric obstruction with the stone. Trials of augmenting litholytic activity of drugs are then of considerable health significant. Many natural products and nutraceuticals have different mechanisms that favour improvement of overall prognosis of urinary calculi.

*Cynodon dactylon* is naturally distributed grass and stands for a significant economic and agricultural problem due competition with field products.

On the other consideration, *C. dactylon* represents a cheap and successful natural resource for veterinary and medical purposes.

From pharmacognosy point of view, *C. dactylon* contains many phytochemical products that are medically active ingredients. Those compounds include

Triticin is a polyfructosan compound that is mainly excreted by the kidney and exerts urinary diuretic (3)(4), antimicrobial (5) and anti-inflammatory actions(8). Those mechanisms are considerable targets in treatment of urinary any urinary disorder like a ureteral stone.

In this current study, an improvement in clinical and ultrasonic findings has significantly been achieved (90% in comparison with 70% of the control) at  $P < 0.05$ . This finding was agreed with similar study on the rat model (3)(8).

## **CONCLUSION**

From the overall results, *C. dactylon* showed a significant improvement in prognosis of lower ureteric stones based on clinical and ultrasound findings for the tested  $N = 10$  sample of patients

## **RECOMMENDATION**

Further follow up of larger test samples of patients with lower ureteric stones is mandatory for accurate evaluation of litholytic activity of *C. dactylon*.

Extention in parameters used in assessment of C. dactylon like inclusion of inflammatory markes and further purification and isolation of each specific ingredient of Cynodon dactylon is necessary to explore the exact intended mechanism of action.

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