## EFFECTIVENESS OF ALPHA BLOCKERS + CORTICOSTEROIDS IN EXPULSION OF URETERIC STONES: A CLINICAL OBSERVATION

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**ABSTRACT**

**Background:** Medical Expulsive Therapy (MET) has become an established part of the protocol for treatment of ureteric stones of less than 5 mm size in the lower 1/3rd of the ureter. Drugs like calcium channel blockers and α-1 adrenergic blockers with or without corticosteroid along with hydration have been used to facilitate expulsion of stones.

**Aims & Objective:** In this study effectiveness of α-1 adrenergic blocker Tamsulosin alone and in combination with corticosteroid deflazacort have been compared.

**Materials and Methods:** Total of 70 symptomatic patients of lower ureteric stones, who presented in the OPD of Rohilkhand Medical College Hospital between Jan 2011 – May 2013, were selected for the study. Patients were randomly divided in two groups: Group 1 (Tamsulosin Group) & Group 2 (Tamsulosin + deflazacort Group).

**Results:** It was found that with Tamsulosin + deflazacort better stone clearance rate with in shorter period was achieved. There was minimum discomfort to the patients during stone expulsion. Success rate was comparable in both groups up to 10 mm stone size. There was marked difference in stones bigger than 10 mm (25% and 62.66% in 11-12 mm size, 16.66% and 57.14% in 13-15 mm size and 0.0% and 50% in 16-17 mm size).

**Conclusion:** MET using Tamsulosin has definite role in passage of smaller size ureteric stone of less than 10mm size. It has acceptable success rate in bigger size stone in our study up to 17 mm size, when Tamsulosin was combined with Deflazacort.

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### Introduction

The incidence of ureteric stones is increasing all over the world. This increase is seen across age, sex and race. Changes in diet pattern and global warming seems to influence these trends.1 Recent reviews of published papers suggest that 90% stones of less than 5mm and 15% stones of sizes between 5mm-8mm will pass spontaneously.2 For stones less than 5mm size recommended management includes analgesics, antibiotics and hydration therapy. With medical expulsive therapy, in which Tamsulosin is the main stay, spontaneous passage of stone upto 10mm has been reported.3

The presence of stone in the ureter causes inflammation and edema. Corticosteroid reduces edema and when combined with α-1 adrenergic receptor antagonists facilitates the passage of stone.4 To avoid adverse side effects, corticosteroid are used for short duration. Deflazacort should be preferred over other glucocorticords, as it has fewer side effects. There is some evidence that Deflazacort in combination with alpha-blockers antagonist is more effective in expulsion of stones of <10mm size.5

Among our patients ureteral account for 20% of urolithiasis and 70% of ureteral stones are located in the lower third of the ureter. Similar observation have been made by other authors also.6,7,8

In the last 20 years ureteral stones treatment modalities have changed radically and MET has become a part of the standard protocol for treatment of smaller size stones in the lower third of the ureter. It increases the expulsion rate and decreases the expulsion time, thereby reducing the cost and lost working days.8 Stones up to 4mm size are expelled in almost all cases. Spontaneous expulsion rate for 4-6mm stones is about 25% and over 8mm size are rarely expelled.9 Different procedures have been recommended for stone of greater than 5mm size. Stones upto 9.5mm have been successfully expelled with MET, the largest size stone being 1.4 cm.10 The time required for stone expulsion depends on the size of the stone. Smaller the stone faster the expulsion and clearance.

Extra corporeal shock wave lithotripsy [ESWL] has been recommended as first line option for ureteric stones of less than 20mm size. Success rate with ESWL in stones of over 8mm size in distal ureter varies from 49.9% to 91.1% and decreases as stones size increases.10 Few centres use ureteroscopy [URS] as first line treatment to
achieve better stone free rate.\[^{10}\]\] MET being cheap, easy and convenient procedure can be opted as first line treatment before ESWL or URS.

Hancock reported presence of α adrenergic and β adrenergic receptors in human ureter.\[^{11}\] Additional studies substantiated the view of presence of α-1d adrenergic receptors in the human ureter, and α-1 blocker, facilitates the passage of ureteric stones in 80.4% of cases (Cervinakov et al.\[^{12}\] Tamsulosin- an alpha 1 antagonist, inhibits basal-tone and decreases peristaltic frequency and amplitude resulting in increased fluid transport and decreased intra ureteral pressure and they also block the conduction of Visceral referred pain.\[^{13}\]"

Stone in ureter causes ureteral muscle spasm, infection leading to inflammation and oedema. In the pioneering work of Borghi, the use of methyl prednisolone with other drugs was shown to increase the rate of spontaneous stone passage.\[^{14}\] This has led to study of various aspect of MET. There is some evidence that a combination of α -blocker and Corticosteroid might be more effective than treatment with α-blocker alone. Among the Glucocorticoid’s, Deflazacort, a synthetic Oxazoline derivative of prednisolone have shown equivalent anti-inflammatory potency with less side effect.

**Materials and Methods**

Total of 70 symptomatic patients of lower ureteric stones, who presented in the OPD of Rohilkhand Medical College Hospital between Jan 2011 – May 2013, were selected for the study. 45 were male and 25 were female patients, Age was between 15-45 years. None of the patients had any complications related to stone disease. None suffered from any systemic or metabolic disease. Renal lab parameters in all patients were normal.

Patients were randomly divided in two groups [group 1 & group 2]. Both groups had equal number of patients. Both groups received antibiotics based on culture and sensitivity, Droxtavein Tab. SOS, Tamsulosin 0.4 mg OD, Till the time stones are expelled or upto 30 days maximum. 1L of Dextose normal saline 1V BD and Inj. Frusmede 20mg BD for 7 days and there after patient was advised to take at least 3 L of oral fluid daily. Group 2 in addition to the above were given Deflazacort 18 mg OD for 3 days 12 mg OD for 2 days and 6mg on the 6th day. On 7th day patient was discharged. Treatment was considered successful when stone was expelled within 30 days and patients had fewer and milder symptoms.

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<thead>
<tr>
<th>Table 1: Success rate of stone expulsion</th>
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<tr>
<td>Size of the Stone</td>
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<td>16-17 mm</td>
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**Discussion**

Nephrolithiasis is a common problem in northern part of India. Most of these patients also have ureteric calculi of varying sizes. Small ureteral calculi, usually pass spontaneously but the patient usually experience severe pain during expulsion of stone.

MET is aimed at facilitating passage/expulsion of ureteric stone with minimal symptoms. To achieve this, number of drugs like corticosteroids, hormones, NSAID (Non steroid Anti-inflammatory drug), calcium channel blocker and α-1 adrenergic blockers have been evaluated. Encouraging results have been reported with

With 7-8 mm size stone in group 1, out of total 8 patients stone clearance was achieved in 6 patients within 7 days, (SR-75%); where as in group 2, out of total 9 patients stone clearance was achieved in 7 patients within 5 days, (SR 77.7%). With 9–10 mm size stone in group 1, out of total 6 patients stone clearance was achieved in 3 patients within 9-10 days (SR-50%); where as in group 2, out of total 5 patients stone clearance was achieved in 3 patients within 6-7 days, (SR-60%).

With 11-12 mm size stone in group 1, out of total 8 patients, stone clearance was achieved in 2 patients within 25 days (SR-25%); where as in group 2, out of total 8 patients stone clearance was achieved in 5 patients within 10-12 days, (SR-62.6%). With 13-15 mm size stone in group 1, out of total 6 patients, stone clearance was achieved in 1 patients within 22 days (SR-16.66%); where as in group 2, out of total 7 patients stone clearance was achieved in 4 patients within 15-17 days, (SR-57.14%). With 16-17 mm size stone in group 1, out of total 7 patients, stone clearance was not achieved in any patients (SR-0.0%); where as in group 2, out of total 6 patients stone clearance was achieved in 3 patients within 26-28 days, (SR-50%).

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\[^{10}\]\[^{11}\]\[^{12}\]\[^{13}\]\[^{14}\]
use of calcium channel blockers and α-1 adrenergic blocker. Calcium channel blockers suppress smooth muscle contraction and reduce ureteral spasm, whereas α-1 adrenergic blockers decreases ureteral muscle tone and frequency and force of peristalsis. Corticosteroid reduces inflammatory reaction and sub mucosal oedema in the vicinity of stone.

A meta-analysis of nine randomized clinical trials have compared calcium channel blockers or α-1 blockers with or without corticosteroids against placebo or no treatment. This has shown that Patients treated with MET had a 65% of greater chance of spontaneous passage of stone than the control group. In this analysis there was no significant benefit of adding corticosteroid with calcium channel blockers or α-1 blockers.

One randomized control trial compared Tamsulosin vs Tamsulosin + Corticosteroids and showed no difference in stone passage rates, but corticosteroids group took lesser time to achieve stone passage. Another meta-analysis of 11 RCT’s with 911 patients reported 44% higher likelihood of spontaneous passage with α-1 blockers compared with no treatment. Dellabella and associates reported that MET with Tamsulosin was superior to both placebo and Nifedipine.

We have compared the effectiveness of α-1 blockers with α-1 blockers + corticosteroids. Group 1 was given only α-1 blocker and Group 2 was given α-1 blockers + corticosteroids. Rest of the treatment in both groups was same. α-1 blocker used was Tamsulosin and Corticosteroid used was Deflazacort. In our study we consistently found better stone clearance rate and earlier passage of stone across all stone sizes in Tamsulosin + Deflazacort group. Stone size in our study varied from 7-17 mm. The reported biggest size stone to have been passed with MET so far was 15 mm. We had 13 patients with stone sizes of 16-17 mm. 7 were in Tamsulosin group and 6 in Tamsulosin + Deflazacort group. In Tamsulosin group no stone clearance was achieved at the end of 30 days, where as in Tamsulosin + Deflazacort group 3 stones were cleared in 26-28 days (S.R. 50%).

**Conclusion**

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**References**