

# AN OBSERVATIONAL STUDY OF EFFICACY OF MIRABEGRON IN MEDICAL EXPULSIVE THERAPY OF LOWER URETERIC CALCULUS

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## Introduction:

Spontaneous expulsion ratios (SER) of distal ureteral stones is 25 - 53% for  $\leq 10$  mm stones.<sup>1</sup> Spontaneous expulsion depends on stone size, configuration, location, spasm of ureter smooth muscles, oedema in the ureter, and anatomic narrowing. To reduce the complications like renal colic attacks, urinary system infection, hydro-uretero-nephrosis, and pyelonephritis and accelerate stone expulsion, many treatments (alpha adrenergic blockers, calcium channel blockers etc.) have been tried so far. Matsumoto et al. confirmed the expression of mRNAs of  $\beta 3$  adrenalin receptors in the ureter, stimulation of these receptors may provide relaxation in the intramural ureteral segment.<sup>2</sup>

Because of this, Mirabegron can be thought as alternative MET agent. As acting through different pathway and low side effect profile, it can be thought to have more advantage than others.

## Aims and Objectives:

To study the efficacy of Mirabegron in medical expulsive therapy of radiologically defined lower ureteral calculi.

## Materials and Methods:

Prospective Observational Study

100 Patients (> 12 years of age) with confirmed unilateral single stone of size upto 10 mm in radiologically defined lower ureter attending urology OPD or admitted in urology at Department of Urology, I.P.G.M.E&R, Kolkata from 1st November 2019 to 31st October 2020 were included.

Pregnant patients or patients with severe hydronephrosis, previous ureter and bladder surgery, uncontrolled hypertension, IHD or h/o CVA, fever with chills, feature of distal obstruction, transplanted kidney / solitary kidney, serum Creatinine > 1.5mg/dL were excluded.

CONFIRMED CASES OF SOLITARY LOWER URETERIC CALCULUS  $\leq 10$  MM SIZE. (n = 100)

**GROUP A: (n = 50)**  
**Tab. Diclofenac (50mg)**  
twice daily for initial 5 days, then on demand.

**GROUP B: (n = 50)**  
**Tab. Diclofenac (50mg)**  
twice daily for initial 5 days than on demand  
+  
**Tab. Mirabegron (50mg)**  
once daily for 28days.

Follow up with clinical examination, screening USG KUB on weekly basis, and NCCT KUB after 28th day of therapy (or earlier, if patient documented passage of stone).

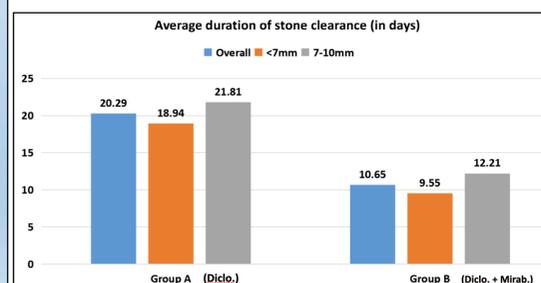
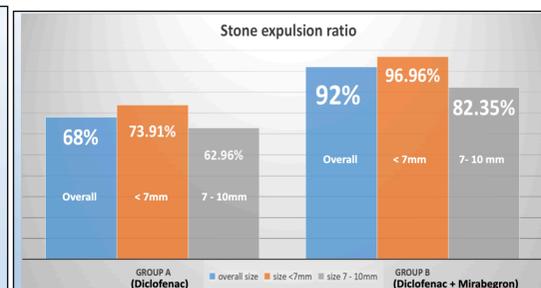
Patients were asked to look for passage of stone in urine during 28 days of MET and if they found stone in urine than to note down the day.

They were planned for surgical intervention (Ureteroscopic lithotripsy), if stone found in ureter after 28 days of MET

## Results:

### FOLLOW UP RESULTS IN BOTH GROUPS

	Group A: Diclofenac (n: 50)	Group B: Diclofenac + Mirabegron (n: 50)	p
Stone expulsion ratio			
•Overall	34 (68%)	46 (92%)	<b>0.0027</b>
•< 7 mm	17 (73.91%)	32 (96.96%)	<b>0.01026</b>
•7 - 10mm	17 (62.96%)	14 (82.35%)	0.1698
Stone expulsion time (in days) (mean± SD)			
•Overall	20.29 ± 5.512	10.65 ± 4.294	<b>0.00001</b>
•<7mm	18 ± 5.19	9.55 ± 4.39	<b>0.00001</b>
•7 - 10mm	21.81 ± 5.46	12.21 ± 3.62	<b>0.00001</b>
Episodes of pain after initial 5 days. (mean ± SD)	10.83 ± 3	9.56 ± 3.52	0.055
Storage symptoms subsided (in days) (mean ± SD)	<b>16.28 ± 5.65</b>	<b>6.2 ± 2.58</b>	<b>0.00001</b>



## Discussion:

In our study, expulsion of stone was **statistically increased with mirabegron, especially when stone size <7mm**. Although there was no significant difference for expulsion ratio of 7-10mm size stone between two groups, but **there was significant difference between two groups, when duration of expulsion (in 7mm to 10mm stone) was considered**. Sayed et al, showed that 88.9% of patients in tamsulosin group having distal ureteral stone had passed stone (40 out of 45)<sup>3</sup>. In our study 92% (46 out of 50) of patients in mirabegron group had passed stone.

## Conclusion:

**In the current study, mirabegron has been shown to be an effective treatment modality for expulsion of lower ureteric calculus, especially if the stone size is less than 7mm.**

## Reference:

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- Sayed MAB, Yosr AMA, Abdalla MA, El-Azab AS. Efficacy of tamsulocin in medical expulsive therapy for distal ureteral calculi. Scandinavian J Urol and Nephro.2008; 42: 59-62.