

A PROSPECTIVE RANDOMIZED STUDY OF TOLTERODINE AND DOXAZOSIN MONOTHERAPY AS THE FIRST LINE TREATMENT OF MALE LOWER URINARY TRACT SYMPTOMS WITH PREDOMINANT STORAGE SYMPTOMS BASED ON IPSS VOIDING TO STORAGE SUBSCORE RATIO

Hypothesis / aims of study

Antimuscarinics appear to be an effective and safe alternative treatment for male storage lower urinary tract symptoms (LUTS). However, whether antimuscarinics is better than alpha-blocker for men with predominant storage symptoms is still not determined. We conducted a prospective randomized study to compare the therapeutic effect between antimuscarinics and α -blockers monotherapy as the first-line treatment for men with predominant storage symptoms based on International Prostate Symptom Score (IPSS) voiding to storage subscore ratio (IPSS-V/S).

Study design, materials and methods

Men aged 40 years and older with total IPSS (IPSS-T) ≥ 8 , IPSS-V/S ≤ 1 and postvoid residual urine (PVR) less than 250 ml were prospective enrolled from June 2011 to December 2011. Patients were randomized assigned to two treatment groups while tolterodine 4 mg and doxazosin 4 mg were given separately. The primary endpoint was Patient Perception of Bladder Condition (PPBC) at 1 month. A PPBC change of 2 scores after treatment was considered as effective treatment. Patients who failed the initial treatment were shifted to treatment with the other test drug.

Results

One-hundred and thirty-one patients were prospectively enrolled. The baseline parameters were similar between doxazosin and tolterodine group (Table 1). After medical treatment for 1 month, IPSS storage subscore (IPSS-S) and quality of life (QoL) decreased significantly in both groups. But significant increased maximal flow rate (Q_{max}) and decreased IPSS-T were noted only in patients receiving doxazosin. No patient treated with tolterodine developed urinary retention, but significantly increased PVR (from 55.5 to 83.3 ml) was noted after tolterodine monotherapy (Table 2). Four patients receiving doxazosin complained dizziness while only 1 patient receiving tolterodine complained dysuria. Twenty-sixty of 37 patients (73%) receiving doxazosin and 27 of 38 patients (71%) receiving tolterodine reported an improved outcome. The success rate is higher in patients receiving tolterodine (79%) than those receiving doxazosin (45%) when patients with total prostate volume (TPV) less than 40 ml were analyzed ($p=0.087$) (Table 3).

Interpretation of results

Male LUTS may be due to bladder or bladder outlet disorders. Treatment of male LUTS based on IPSS V/S subscore ratio provides an easy way for the first line monotherapy. This study show either doxazosin or tolterodine treatment can have a success rate of >70% in overall patients with IPSS V/S ≤ 1 , suggesting that the male LUTS can be generated from different lower urinary tract disorders. Although the data did not reach a statistical significance, we found the trend that when TPV ≥ 40 ml more patients had a successful doxazosin treatment outcome. On the other hand, when patients had TPV < 40 ml, treatment with tolterodine provided a higher success rate. If the number of studied patients increased, the difference of success rates between patients with large and small TPV will become more evident.

Concluding message

Both doxazosin and tolterodine can improve storage symptoms and quality of life in male patients with predominant storage symptoms. In overall patients, there was no significant advantage of tolterodine monotherapy over doxazosin monotherapy. However, patients received tolterodine monotherapy had higher rate of improved outcome than those received doxazosin monotherapy when their TPV were less than 40 ml.

Table 1 Baseline data of two study groups

	Total (n=131)	Doxazosin group (n=65)	Tolterodine group(n=66)	P value*
Age	68.7 \pm 11.5	70.0 \pm 11.5	67.4 \pm 11.6	0.206
IPSS-V	3.4 \pm 3.1	3.4 \pm 3.3	3.3 \pm 2.9	0.946
IPSS-S	6.6 \pm 3.1	6.7 \pm 3.4	6.5 \pm 2.9	0.768
IPSS-T	9.9 \pm 5.5	10.0 \pm 5.8	9.9 \pm 5.2	0.837
QoL	3.1 \pm 1.1	3.0 \pm 1.1	3.2 \pm 1.1	0.245
Q _{max} (ml/s)	13.12 \pm 7.22	11.76 \pm 5.95	14.45 \pm 8.13	0.079
Volume (ml)	182.7 \pm 120.1	164.2 \pm 108.5	200.5 \pm 128.5	0.088
PVR (ml)	57.0 \pm 87.0	58.5 \pm 36.7	55.5 \pm 69.4	0.843
TPV	51.4 \pm 32.5	55.1 \pm 35.2	47.8 \pm 29.4	0.195
TZI	0.37 \pm 0.13	0.39 \pm 0.12	0.36 \pm 0.13	0.124
PSA	6.22 \pm 10.77	7.58 \pm 12.21	4.81 \pm 8.92	0.149

CRP	0.84±2.06	0.79±1.76	0.90±2.30	0.794
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Table 2 Parameters changes of two treatment groups after medical treatment for 1 month

	Doxazosin Group (n=37)			Tolterodine Group (n=38)		
	Pre-Tx	Post-Tx	P-value	Pre-Tx	Post-Tx	P-value
IPSS-T	10.0±5.8	6.3±3.5	0.003	9.9±5.2	7.8±5.3	0.197
IPSS-V	3.4±3.3	2.4±2.6	0.139	3.3±2.9	3.1±3.9	0.343
IPSS-S	6.7±3.4	3.9±2.2	0.001	6.5±2.9	4.7±2.7	0.001
Qmax	11.76±5.95	13.34±6.61	0.047	13.00±8.37	14.38±7.71	0.604
Volume	194.2±108.5	227.1±108.0	0.187	240.51±128.59	245.4±119.6	0.833
PVR	58.5±36.7	46.3±33.6	0.154	55.5±69.4	83.3±11.7	0.079
QoL	3.0±1.1	2.1±0.7	0.001	3.2±1.1	2.4±0.8	0.001

Table 3 The success rates in overall patients and different prostate volume subgroups

	Doxazosin Group (n=37)	Tolterodine Group (n=38)	P value
PPBC decreased ≥ 2	26 (73%)	27 (71%)	0.853
PPBC decreased <2	10 (27%)	11 (29%)	
TPV ≥ 40 ml (n=50)			
PPBC decreased ≥ 2	22 (85%)	16 (67%)	0.138
PPBC decreased <2	4 (15%)	8 (33%)	
TPV < 40 ml (n=25)			
PPBC decreased ≥ 2	5 (45%)	11 (79%)	0.087
PPBC decreased <2	6 (54%)	3 (21%)	

Disclosures

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