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FIRST-LINE ANTIMUSCARINIC MONOTHERAPY IS SAFE AND EFFECTIVE FOR MEN WITH PREDOMINANT INTERNATIONAL PROSTATE SYMPTOM SCORE STORAGE SUBSCORE BASED ON IPSS-VOIDING/STORAGE RATIO

Hypothesis / aims of study

Most of the first-line treatments for male lower urinary tract symptoms (LUTS) focus on prostate and based on alpha-blockers traditionally. Antimuscarinic therapy is always put in the second line as monotherapy or added to combine with alpha-blockers when LUTS do not improve. Physicians usually concern that the inhibitory effect of antimuscarinics might aggravate voiding difficulties or cause urinary retention. There is still controversy about which patients can be beneficial from and who are at risk for first-line antimuscarinic monotherapy for LUTS. We conduct a prospective study to investigate the safety and efficacy of first-line antimuscarinics monotherapy for men with predominant storage based on the International Prostate Symptom Score (IPSS) voiding to storage subscore ratio (IPSS-V/S). This study was also aimed to identify the risk factors of increased post-void residual (increased PVR by ≧50 ml) and aggravating IPSS voiding subscore (increased IPSS-V by ≧4) after first-line tolterodine monotherapy for men with a IPSS-V/S ≦1.

Study design, materials and methods

We conducted a prospective open-label study in men with total IPSS (IPSS-T) 8 or more. Total prostate volume (TPV), transition zone index (TZI), maximum flow rate (Qmax), PVR, and voiding efficiency (VE) were also obtained. The voiding (IPSS-V) and storage IPSS subscores (IPSS-S) were recorded separately. Men with a higher IPSS-S than IPSS-V (IPSS-V/S ≦1) received first-line tolterodine (4mg QD) monotherapy regardless of their TPV, TZI, Qmax, PVR, or PSA values. Men with active infection, abnormal digital rectal exam, PSA>4 ng/ml without prostate biopsy, or previous transurethral surgery were excluded.

Results

One-hundred and twenty-five consecutive men (aged 31 to 90 years) received first-line tolterodine monotherapy for 1 month. The mean IPSS-T, IPSS-S decreased, and quality of life improved significantly ($p<0.001$). At 1 month, 73.2% of patients reported a satisfactory result based on IPSS quality of life improvement. No patient developed acute urinary retention, but significantly increased PVR (from 51.9 ml to 65.7 ml) was noted. Increased PVR (≧50 ml) and IPSS-V (≧4) were found in 17 (13.6%) and 18 (14.4%) patients, respectively. Patients with increased PVR≧100 ml after treatment had a baseline PVR (107.7±100.2 ml) greater than those with a PVR<100ml (38.8 ±35.9 ml) at 1 month ($p<0.05$). However, the baseline parameters including TPV, Qmax, PVR, VE, or severity of IPSS, were similar between patients with and without increased PVR≧50 ml or IPSS-V after treatment.

Interpretation of results

The mean IPSS-T, IPSS-S, and quality of life decreased significantly after first-line tolterodine monotherapy for 1 month regardless the baseline prostate volume, Qmax, PVR, VE, or IPSS severity. Our patients have mean baseline TPV>= 40 ml and PSA > 3 ng/dl, which implies that tolterodine monotherapy is safe and effective for patients with large total prostate volume or high PSA. But our conclusion cannot extend to patients with large PVR because the mean baseline PVR was only 51.9 ml in our study. However, patients with PVR ≧100 ml after tolterodine monotherapy for 1 month were elder, with lower baseline Qmax, and higher baseline PVR. In addition, we cannot identify risk factors of increased PVR of ≧50 ml or aggravated IPSS-V of ≧4 after tolterodine monotherapy in this study.

Concluding message

First-line tolterodine monotherapy for men with IPSS-V/S ≦1 is safe and effective with no increased risk of urinary retention and only mildly increased PVR is noted. For these patients, it is difficult to identify risk factor of increased PVR or IPSS-V using baseline parameters.

Table 1. Changes of parameters after antimuscarinic monotherapy for 1 month

	Pre-Treatment	Post-Treatment	P value
IPSS-T	14.82 ± 5.72	10.82 ± 6.56	0.000
IPSS-V	5.34 ± 3.69	4.69 ± 4.51	0.156
IPSS-S	9.61 ± 3.23	6.15 ± 3.26	0.000
Qmax	12.85 ± 8.26	13.83 ± 8.23	0.116
PVR	51.85 ± 62.44	65.73 ± 64.39	0.034
Volume	209.67 ± 163.74	230.48 ± 149.25	0.121
QoL	3.90 ± 0.57	2.77 ± 1.00	0.000

Table 2. Comparisons of baseline parameters between patients with and without increased PVR or IPSS-V after tolterodine monotherapy for 1 month

	PVR increased			IPSS-V increased		
	<50 ml	≧50 ml	P value	<4	≧4	P value
TPV< 40 ml	43(79.6%)	11(20.4%)	0.490	47(79.7%)	12(20.3%)	0.437

TPV≧ 40ml	28(82.4%)	6(17.6%)		30(83.3%)	6(16.7%)	
Qmax<15	44(77.2%)	13(22.8%)	0.244	46(76.7%)	14(23.3%)	0.203
Qmax>=15	25(86.2%)	4(13.8%)		26(86.7%)	4(13.3%)	
PVR<50	44(78.6%)	12(21.4%)	0.332	49(83.1%)	10(16.9%)	0.305
PVR>=50	28(84.8%)	5(15.2%)		26(76.5%)	8(23.5%)	
V.E<90	43(82.7%)	9(17.3%)	0.330	43(78.2%)	12(21.8%)	0.398
V.E>=90	26(76.5%)	8(23.5%)		29(82.9%)	6(17.1%)	
IPSS-T<20	21(70.0%)	9(30.0%)	0.059	26(81.3%)	6(18.8%)	0.574
IPSS-T>=20	51(86.4%)	8(13.6%)		49(80.3%)	12(19.7%)	

Table 3 Comparisons of baseline data between patients with PVR>=100 ml and <100 ml after tolterodine monotherapy for 1 month

Baseline data	PVR>=100 ml	PVR<100 ml
Age	74.1 ± 12.1*	66.0 ± 11.9*
IPSS-T	15.5 ± 5.9	14.5 ± 5.5
IPSS-V	6.0 ± 3.5	5.6 ± 3.8
IPSS-S	9.4 ± 3.3	9.1 ± 3.2
IPSS-V/S	0.66 ± 0.30	0.69 ± 0.58
PSA (ng/dl)	6.5 ± 7.4	3.8 ± 5.0
TPV (ml)	52.9 ± 41.7	37.6 ± 17.8
Qmax (ml/s)	8.3 ± 3.4*	13.5 ± 8.7*
PVR (ml)	107.7±100.2*	38.8 ±35.9*

*p<0.05 by ranksum test

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What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**Yes**
Specify Name of Ethics Committee	**Research Ethics Committee of Buddhist Tzu Chi General Hospital**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**