160

CHARCTERISTICS OF 5-α-REDUCTASE-INHIBITOR-INDUCED PROSTATE VOLUME REDUCTIONS

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Introduction

- Medical therapy is the usual first-line management of uncomplicated benign prostatic hyperplasia (BPH) and alpha-adrenergic receptor blockers and 5-alpha-reductase inhibitors (5-ARIs) are two mainstays.
- It is known that BPH develops in the transition zone and 5-ARIs reduce prostate volume [1, 2].
- We are questioning whether the transition zone is more affected by 5-ARIs than other zones such as central zone or peripheral zone. We evaluated whether transition zone is affected more by volume reduction of non-selective 5-ARIs.

Methods

- We reviewed the medical records of men who had been taking alpha blocker and 5-ARI for managing their lower urinary tract symptoms (LUTS) secondary to benign prostatic hyperplasia and had serial transrectal ultrasonograpy (TRUS) images.
- The data of patients who had a history of taking 5-ARI before this investigation was excluded.
- TRUS images were taken at baseline before taking 5-ARI and at 1 year after the commencement of dutasteride (0.5 mg) or finasteride (5.0 mg).
- Total prostate and transition zone volumes (TPV and TZV) were measured during the ultrasound.
- We used transition zone index (TZI) to determine the relative volume of transition volume to total prostate volume. TZI was calculated as the ratio of TZV to TPV. Volume reduction (%) was calculated as the ratio of volume reduction to baseline prostate volume.
- Additionally, serum prostate-specific antigen (PSA) concentrations were measured at baseline and then at 1 year and 2 years after the 5-ARIs were commenced.

Results

Patients and baseline characteristics

- All of the 43 patients (mean age, 68.5 yr ± 7.2; range, 53–82 yr) with clinical lower urinary tract symptoms suggestive of benign prostatic hyperplasia and who were 5-ARI-naïve were prescribed dutasteride (0.5 mg, 74.4%, 32/43) or finasteride (5.0 mg, 25.6%, 11/43) for more than 1 yr (13.5 ± 4.2 months).

Changes clinical parameters and prostate volume at 1 year after the commencement of 5-ARIs

- The baseline mean TPV, TZV and TZI values were 58.0 ± 25.6 cm^3, 30.8 ± 16.6 cm^3, and 0.52 ± 0.13, respectively (Table 1).
- At 1 yr after the commencement of the 5-ARIs, the mean TPV, TZV, and TZI values were 48.0 ± 23.5 cm^3, 28.1 ± 19.0 cm^3, and 0.55 ± 0.13, respectively (Table 1).

% Volume Reduction at 1 year after the commencement of 5-ARIs

- The TZI value is not significantly different at 1 yr compared with baseline ($p > 0.05$), while the TPV and TZV reductions are 22.7 ± 15.2% and 27.2 ± 16.8%, respectively; there is no significant difference between the TPV and TZV volume reductions ($p > 0.05$) (Table 2).

Table 1. Changes of prostate volume and PSA at baseline and at 1 year after the commencement of 5-ARI

(n=43)	TPV (cm^3)	TZV (cm^3)	TZI		Mean PSA (ng/mL)
Baseline	58.0 ± 25.6	30.8 ± 16.6	0.52 ± 0.13	P>0.05	5.31
After*	48.0 ± 23.5	28.1 ± 19.0	0.55 ± 0.13		2.16

After*: After 1 year of treatment with 5 ARI

Table 2. % Volume Reduction. %TPV Reduction = TPV1 – TPV2 / TPV1; %TZV reduction = TZV1 – TZV2 / TZV1

	% Volume Reduction	significance
Mean % TPV Reduction (n=36)	22.7 ± 15.2	P>0.05
Mean % TZV Reduction (n=27)	27.2 ± 16.8	

*TPV1 = Baseline total prostate volume; TPV2 = total prostate volume after 1 year treatment; TPZ1 = Baseline transition zone volume; TPZ2 = transition zone volume after 1year treatment

Conclusions

These results show that prostate volume reduction induced by 5-ARIs occurs in the entire prostate universally, rather than in the transition zone specifically.

References

1.McNeal JE. Origin and evolution of benign prostatic enlargement. Invest Urol 1978;15:340-5.
2. Finasteride (MK-906) in the treatment of benign prostatic hyperplasia. The Finasteride Study Group. Prostate. 1993;22(4):291-9.