

## OBSERVATION OF ACUTE CHANGES IN THE DIAMETER OF THE PROSTATIC URETHRA WITH AN ALPHA1A-ADRENERGIC BLOCKER USING MAGNETIC RESONANCE IMAGING.

### Hypothesis / aims of study

Alpha<sub>1</sub>-adrenoceptor blockers relax the bladder neck and prostate smooth muscle, decrease the pressure in the prostatic urethra and bladder neck, and relieve the dynamic component of bladder outlet obstruction. There have been few reports describing the effects of alpha-blockers using imaging techniques. Recently, Silodosin has been developed as a novel, highly uroselective alpha1A-adrenoceptor antagonist. We investigated the acute changes in the diameter of the prostatic urethra with an alpha1A-blocker using magnetic resonance imaging.

### Study design, materials and methods

The subjects were 14 healthy male volunteers and none of them had any prostatic diseases or voiding dysfunction. We also confirmed the nonexistence of organic abnormalities in their pelvic organs through MRI examination. Seven subjects out of 14 were included in the young group (22.7±0.7 years, mean±S.D.). The remaining subjects were included in the middle-age group (62.3±0.7 years). MR images were obtained under control/baseline situation and twice, 90 minutes and 120 minutes, after taking 4mg silodosin. MR imaging was performed using a 0.2T permanent magnet system. After localization of the prostate MR imaging, T2-weighted sagittal images were obtained after administration of an alpha-blocker and resting in all subjects.

In order to obtain objective evaluation of the morphological changes of the prostate, the diameter of the prostatic urethra (DPU) and Sagittal area of bladder (SAB) were measured on T2WI at each time point (Fig.1). Statistical analyses were performed using Friedman test or Wilcoxon signed-rank test or Mann-Whitney U test with p<0.05 considered statistically significant.

### Results

DPU increased by an average of 1.34 mm after administration of the α-blocker (Fig. 2). DPU expanded significantly 90 and 120 minutes after administration of the drug in both the young and middle-age group (Fig. 2). There was no significant difference in DPU between 90 and 120 minutes after the administration of silodosin.

We compared the DPU of the young and middle-age groups. There was no significant difference between the two groups.

### Interpretation of results

In this study we demonstrated that the acute effect of the alpha1A-adrenoceptor antagonist could be observed with imaging technology, such as MRI. One limitation of this study is that the subjects were all healthy volunteers and thus we could not demonstrate a correlation between the change of the DPU and prostatic urethral pressure. Nevertheless this is the first report to investigate acute changes in the diameter of the prostatic urethra with alpha1A-blocker using magnetic resonance imaging. Further study is needed to resolve these limitations.

### Concluding message

In this study we showed that administration of an alpha1A-adrenoceptor antagonist increased the diameter of the prostatic urethra using magnetic resonance imaging.

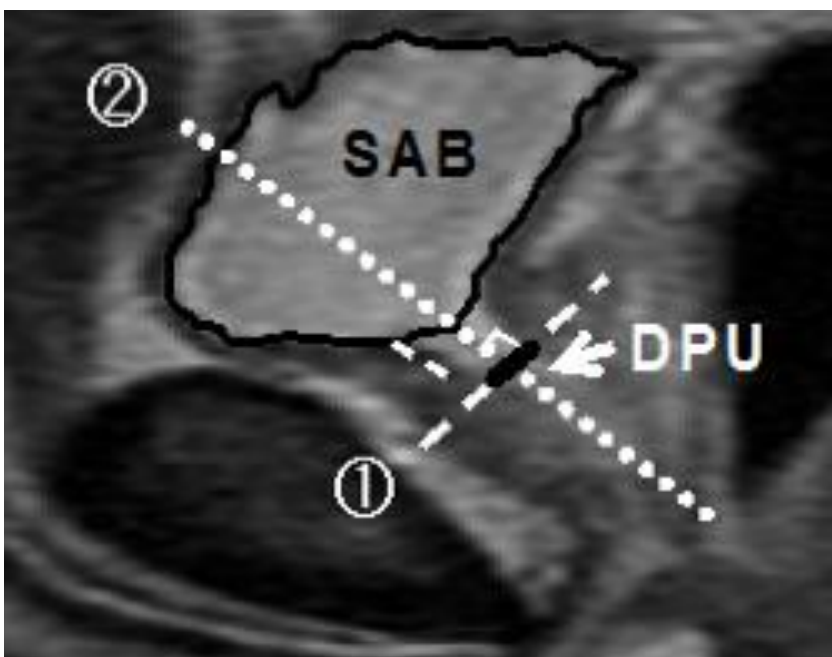
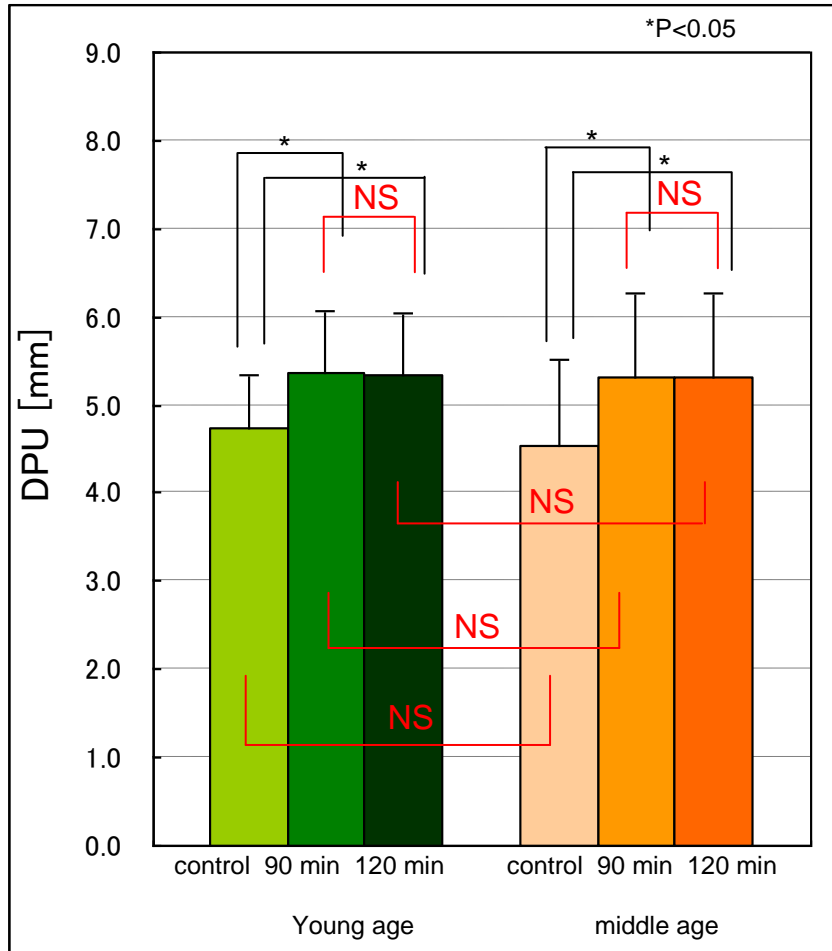


Fig. 1 DPU and SAB in T2WI

Fig. 2 The mean value of DPU



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<i>Is this a clinical trial?</i>	No
<i>What were the subjects in the study?</i>	HUMAN
<i>Was this study approved by an ethics committee?</i>	Yes
<i>Specify Name of Ethics Committee</i>	the Ethics Committee Graduate School of Medicine, Tohoku University
<i>Was the Declaration of Helsinki followed?</i>	Yes
<i>Was informed consent obtained from the patients?</i>	Yes