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THE RELATIONSHIP BETWEEN METABOLIC SYNDROME AND PROSTATE VOLUME IN MEN UNDER 50 YEARS IN KOREAN

Hypothesis / aims of study
The metabolic syndrome (MS) has been accepted as the important cause of benign prostatic hyperplasia (BPH) in old ages [1]. But, there were no studies about the influence of metabolic syndrome on prostate volume in relatively young adults. We evaluate the relationship between factors of MS to prostate volume in men under 50 years who visited our health promotion center.

Study design, materials and methods
Among the subjects who visited the health promotion center for general health checkup from March 2009 to June 2010, a total of 968 male subjects aged 30 to 49 years were enrolled. Prostate volume in transretal ultrasonography (TRUS), PSA, digital rectal examination (DRE), urinalysis and MS-related parameters were investigated. We excluded the subjects with pyuria, abnormal PSA and DRE findings. The presence of the MS was determined according to the American Heart Association/National Heart, Lung, and Blood Institute (AHA/NHLBI) 2005. We evaluated the relationship of prostate volume with metabolic syndrome and MS-related parameters

Results
The mean prostate volume and PSA were 19.1±6.7cc and 1.2±1.3ng/ml, respectively. The prostate volume was not significantly larger in the MS group (20.0±7.4cc) than that in the non-MS group (19.0±6.5cc)(p=0.232). The results were further analyzed according to MS-related parameters. The prostate volumes in subjects with abnormal fasting blood sugar (FBS)(20.1±6.9cc) and abnormal waist circumference (WC)(20.9±7.0cc) were significantly larger than that of subjects with normal parameters (17.6±6.1cc, 18.7±6.6)(p=0.001). When separately analyzed according to ages (30 to 39 years and 40 to 49 years), the prostate was significantly larger in abnormal FBS and WC groups compared to normal controls (Table).
Based on the logistic regression analysis, the FBS level and WC size revealed a significantly positive correlationship with the prostate volume by showing the odd ratios of OR=1.44 (95% confidence interval (CI) 1.3-1.64) and OR=2.3 (95% CI 1.47-3.61), respectively.

Interpretation of results
Abdominal obesity and diabetes that are considered as the risk factors of BPH in old ages, which were also risk factors of prostate enlargement in relatively young adults in this study. It is considered to be necessary for young adult males who are not in the age range of showing frequent development of BPH, but showing abnormal FBS level or having abdominal obesity may require more cautions since they have possibilities of having early development of BPH.

Concluding message
There was no difference in prostate volume in subjects with and without MS. But, abnormal FBS and WC groups had larger prostate than normal groups. The abnormal FBS and WC could be the risk factors of BPH in relatively young adults like old ages. For populations with these components of MS would require more attention toward early development of BPH.

Table. Comparison of prostate volume according to MS factors.

		Ages					
		All subjects		30-39 years		40-49 years	
		PV	*p*-value	PV	*p*-value	PV	*p*-value
FBS(mg/dl)	normal(<100)	17.6±6.1	**0.001**	15.9±5.4	**0.001**	18.2±6.2	**0.001**
	abnormal(≧100)	**20.1±6.9**		**17.8±6.0**		**21.4±7.0**	
BP(mmHg)	normal(<130/85)	19.3±6.6	0.155	17.1±5.8	0.459	20.3±6.7	0.061
	abnormal(≧130/85)	18.7±6.9		17.7±6.0		19.1±7.2	
WC(cm)	normal(<90)	18.7±6.6	**0.001**	16.±5.8	**0.003**	19.6±6.7	**0.008**
	abnormal(≧90)	**20.9±7.0**		**19.5±5.5**		**21.3±7.3**	
HDL-C(mg/dl)	normal(≧40)	19.0±6.5	0.132	17.1±5.7	0.241	19.9±6.7	0.125
	abnormal(<40)	20.5±7.9		18.6±7.3		21.1±7.9	
TG(mg/dl)	normal(<150)	18.8±6.3	0.061	16.9±5.4	0.069	19.8±6.6	0.216
	abnormal(≧150)	20.0±7.4		18.5±7.0		20.5±7.4	
MS	No(≦2 factors)	19.0±6.5	0.232	17.0±5.7	**0.037**	20.0±6.7	0.805
	Yes(≧3 factors)	20.0±7.4		**19.2±6.9**		20.1±7.5	

MS: metabolic syndrome, PV: prostate volume(cc), WC: waist circumference, TG :Triglyceride, HDL-C: high-density lipoprotein cholesterol, FBS: Fasting blood sugar, BP: blood pressure.
The *p*-value determined by chi-square test.

References
1. Eur Urol. 2007 Jan;51(1):199-203

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Was this study approved by an ethics committee?	**Yes**
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Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**