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Park C H[1], Cho Y S[1], Joo K J[1], Park H J[1], Kwon C H[1]
1. Kangbuk Samsung Hospital, Sungkyunkwan University School of Medicine

INSULIN RESISTANCE AND PROSTATIC GROWTH IN HEALTHY KOREAN MEN: A 4-YEAR LONGITUDINAL STUDY

Hypothesis / aims of study
Benign prostatic hyperplasia (BPH) is a highly prevalent disease in the aged men. Many reports indicate the correlation between metabolic syndrome (MS) and BPH. Insulin resistance (IR) was recognized as a key factor in MS. We investigated the relationship between IR and annual prostatic growth rates in healthy Korean men.

Study design, materials and methods
A total of 144 men who visited to health care center for a routine health check up included in this prospective study from June 2010 to June 2015. We excluded men who had abnormal serum PSA level ($\geq$ 4ng/ml), history of prostate surgery or who were taking prostate related medication. They were divided into two groups according to IR. Total prostate volume (PV) was measured using transrectal ultrasonogrphy of prostate (TRUS) by one examiner. The homeostasis model assessment of insulin resistance (HOMA-IR) index was calculated using the HOMA algorithm, glucose in mg/dl × insulin in μU/ml/405. The IR cutoff was defined as 2.0 based on a study of Korean Men. Annual total PV growth rates were calculated.

Results
The mean age, serum PSA, PV were 47.04±5.62 years, 1.11±0.64 ng/mL, 23.25±6.56 cc, respectively. There were no significant differences in baseline characteristics including age, underlying disease, serum PSA, PV between two groups. There was no difference in serum PSA changes between two groups during follow up periods. However, the mean annual PV growth rate (1.91±1.36 cc/year) in IR group (n=32) was significantly higher than non-IR group (n=112, 1.04±3.25 cc/year) ($p<0.05$).

Interpretation of results
The mean annual PV growth rate was significantly higher in IR group, IR could be influencing to PV growth and it could be the key factor in pathogenesis of BPH and MS (Table).

Table. Baseline characteristics and prostate volume & serum PSA changes of study population according to IR

	IR (n=32)	No IR (n=112)	p-value
Age (years)	46.09±5.03	47.31±5.78	0.06
DM	9.37% (n=3)	4.46% (n=5)	0.26
HTN	9.37% (n=3)	6.25% (n=7)	0.53
HOMA-IR	2.51±0.54	1.05±0.40	<0.001
PSA (ng/mL)	1.17±0.64	1.09±0.64	0.53
PV (cc)	23.13±6.23	23.28±6.68	0.90
PSAV (ng/mL/yr)	0.01±0.18	0.00±0.43	0.70
PV change (cc/yr)	**1.91±1.36**	**1.04±3.25**	**0.02**[*]

DM: diabetes mellitus, HTN: hypertension, HOMA-IR: homeostatic model assessment-insulin resistance, PSA: prostate specific antigen, PV: prostate volume, PSAV: PSA velocity.
[*] The p-value determined by Mann-Whitney U test.

Concluding message
In this longitudinal study of healthy Korean men, IR group showed a further increase in prostate growth compared to non-IR group. This study demonstrated that IR could be a risk factor of BPH and a common key pathogenesis in BPH and MS. Future studies are needed to confirm our results and to explain underlying mechanisms.