P010 Feasibility of biparametric magnetic resonance imaging (MRI) based prostate cancer screening compared to conventional method in men without prior biopsies, retrospective comparative study

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Introduction & Objectives: To determine the feasibility of Bi-parametric magnetic resonance imaging (BP-MRI) based screening for prostate cancer detection compared with standard digital rectal examination (DRE) and prostate-specific antigen (PSA)-based screening.

Materials & Methods: Retrospective review of consecutive 102 men who underwent standard DRE and PSA-based prostate cancer screening in conventional screening group from July, 2014 to June, 2015 and 121 men who underwent BP-MRI in addition to standard DRE and PSA-based prostate cancer screening in MRI based screening group from May, 2017 to May, 2018. Among MRI based group, 91 men who had a PIRADS 3 or more lesion were considered to screening positive and then performed MR/US fusion biopsy and random prostate biopsy. Other group underwent random prostate biopsy only. Men having PSA level 20 or more were excluded in this study. Patient demographics, DRE staging, PSA level, PSA density (PSAD), BP-MRI, rate of admission for post biopsy complication and associated medical cost to performed a each screening method.

Results: Pre-biopsy demographics of both groups were comparable. MR based screening group (62.6%) could detect the more prostate cancer than conventional group (45%). MR based screening group (40.6%) also could found more clinical significant prostate cancer than the other group (25%). Among 121 men who underwent bp MRI, 30 men who had PIRADS 2 or less lesion were omitted in MR based screening groups because of absent of targetable prostate lesion. Therefore 30 men underwent systemic prostate biopsy. Their systemic biopsy results showed 23 had no cancer, 6 had G6 (3+3), 1 had low volume G7 (3+4) lesion. All of omitted men was considered to having insignificant prostate cancer. When calculating the cost per patient for each method, the usual method required $ 619 and the fusion method cost $660. Despite the increased cost of bp MRI, there was no significant difference between the two groups because of the reduction in costs due to the lack of biopsy in MR based screening group.

Characteristic	Conventional screening with random bx	MRI based screening with MR/US fusion bx	p
Number of men	102	91	
Means(SD)			
Age, years	66.13(8.57)	67.8 (8.23)	0.98
PSA level, ng/ml	7.09 (12.34)	6.88 (10.92)	0.78
Prostate volume, ml	44.95 (27.18)	40.47(20.45)	0.45
PSAD, ng/ml/ml	0.19 (0.21)	0.2 (0.24)	0.92
Number (%)			
DRE			0.98
No palpable nodule	88	71	
Palpable nodule	14	18	
Biopsy Gleason score			0.51
No cancer	56	34	
Gleason 6(3+3)	17	17	
Gleason 7(3+4) low volume	5	3	
Gleason 7(3+4) high volume	12	6	
Gleason 7(4+3)	8	10	
Gleason ≥ 8(4+4)	6	21	
csPCa detection rate, (%)	26 (25.00)	37(40.65)	0.01
Overall PCa detection rate, (%)	46 (45.6)	57(62.63)	0.01
Re-adm rate for complication, (%)	3 (2.94)	2(2.24)	0.89
Mean cost per person, us$	619	660	0.78

Conclusions: MR based screening is well known to detect significant prostate cancer than conventional methods. These can reduce to perform unnecessary biopsy to detect the insignificant prostate cancer without increasing medical cost. However, these results should be validated with prospective study.