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Evaluation of various risk stratification tools in predicting outcome of transperineal ultrasound MRI fusion prostate biopsy

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Introduction:

- Multiparametric MRI has now become a recommended tool for evaluating patients with clinical biochemical suspicious of prostate cancer.
- USG MRI fusion target biopsy and systematic biopsies have higher cancer detection rate.

Objective:

- To evaluate various risk stratification tools in predicting outcomes of transperineal ultrasound MRI fusion biopsy in patients with PIRADS 3 or above lesions on multiparametric MRI.

Patient & Methods:

- A retrospective review was performed on a series of consecutive patients who underwent MRI. guided biopsy of the prostate for clinical suspicion of prostate cancer between Sep 2021 and Jul 2023.

Results

- 230 patients comprising a total of 370 lesions were reviewed.
- The risk data tables of csPCa, related to PIRADS score versus PSA-density (PSAD) categories and prostate health index (PHI) category in patients were shown.
- The multivariate analysis revealed that age, PIRADS score, PHI and PSA density were independent predictors for csPCa.
- Our analyses of prostate cancer localization revealed PIRADS 4-5 lesions located in peripheral zone are more likely to have csPCa (OR 5.4, P <0.05) and PCa (OR 3.8, P <0.05) but no difference in detection rate in peripheral zone versus transitional zone for PIRADS 3 lesions.
- There is a significantly less rate of cancer detection of PIRADS 3 lesions in base region in compared with midgland (OR 0.32, P <0.05) and apex regions (OR 0.07, P <0.05), and no difference was seen in PIRADS 4-5 lesions.

Conclusion

- A combination of PIRADS score and PSAD or PHI categories can help in risk stratification in prostate biopsy.
- Patients with PIRADS 3 lesions have low likelihood of csPCa in our study.
- PIRADS 3 lesions at prostate base have lower PCa detection compared to other region.

Table 1. Risk data table of clinically significant prostate cancer, related to PIRADS score and PSA-density (PSAD) categories / prostate health index (PHI) categories in men

	Low PSAD <0.15	High PSAD >= 0.15	Prevalence ISUP >=2 PCa
PIRADS 3	5% (3/57)	11% (4/35)	8% (7/92)
PIRADS 4-5	21% (14/66)	51% (37/72)	37% (51/138)
All PIRADS	14% (17/123)	38% (41/107)	25% (58/230)
	53% (123/230)	47% (107/230)	
	Low PHI <35	High PHI >=35	Prevalence ISUP >=2 PCa
PIRADS 3	0% (0/29)	21% (3/14)	7% (3/43)
PIRADS 4-5	16% (5/32)	48% (14/29)	31% (19/61)
All PIRADS	8% (5/61)	40% (17/43)	21% (22/104)
	59% (61/104)	31% (43/104)	