

Magnetic resonance imaging and ultrasound fusion biopsy in follow-up of patients in active surveillance protocol. Can PSA density discriminate patients at higher risk of reclassification?

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Introduction & objectives:

- Multiparametric (mp)MRI is increasingly used in the management of patients in Active Surveillance (AS).
- The aim of the study is to evaluate the rate of reclassification in men in AS, stratified on the basis of PI-RADS lesions and PSA-density (PSAD).
- The primary objective of the study was the rate of reclassification, defined as the presence of clinically significant (cs)PCa with Gleason score $\geq 3+4$.

Results:

Median patient age, PSA and PSAD were 67 yrs, 6.3 ng/ml, and 0.12 ng/ml/cm³. Median number of positive cores at initial biopsy was 1 (IQR:1,2). Eighty-four pts (24.7%) had mpMRI(-); 71 pts (20.9%), 146 (42.9%), and 39 (11.5%) had PI-RADS 3,4, and 5 lesions, respectively. At a median follow up of 12 months, 113 patients (33.2%) were reclassified. In pts with mpMRI(-) the rate of reclassification was 18%, while was 28%, 40% and 50% according to PI-RADS 3, 4 and 5, respectively. When we stratified to PSAD, in case of PSAD <0.10 the rate of reclassification was 16%, 22%, 31%, 40% for mpMRI(-),PI-RADS 3, 4 and 5, respectively. In case of PSAD ≥ 0.20 the rate of reclassification was 25%, 35%, 55%, 67% for mpMRI(-),PI-RADS 3, 4 and 5, respectively (Fig.1). At MVA, PSAD ≥ 0.20 (p=0.001;OR 3.0), PI-RADS 5 (p=0.02;OR 3.4) were associated with the higher risk of reclassification, together with the number of positive cores at baseline (p<0.001;OR 2.3).

Materials & methods:

- From 01/2016 to 09/2018 340 pts underwent mpMRI before confirmatory/follow-up biopsy according to PRIAS protocol.
- Pts with negative (-) mpMRI subsequently underwent systematic random biopsy.
- Pts with positive (+) mpMRI (PI-RADS-V2 score ≥ 3) underwent targeted fusion prostate biopsies (3 cores) + systematic random biopsies (12-18 cores).
- Different PSAD cut-off values were tested (<0.10; 0.10-0.20; ≥ 0.20). Multivariable logistic regression analyses (MVA) were used to predict the risk of overall reclassification during follow-up according to PSAD, after adjusting for covariates.

	PIRADS 1-2	PIRADS 3	PIRADS 4	PIRADS 5	P value
Age yrs					
Mean (95% CI)	67.2 (65.7 – 68.7)	65.7 (64.0 – 67.6)	66.6 (65.5 – 67.7)	68.7 (66.1 – 71.3)	0.191
PSA ng/mL					
Mean (95% CI)	6.19 (5.30 – 7.08)	6.78 (4.96 – 8.59)	7.82 (6.79 – 8.85)	10.0 (7.46 – 12.55)	0.010
PSAD					
Mean (95% CI)	0.12 (0.10 – 0.14)	0.13 (0.11 – 0.15)	0.14 (0.13 – 0.16)	0.21 (0.17 – 0.25)	< 0.001
PSAD # (%)					
< 0.10	43 (51.2)	28 (39.4)	58 (39.7)	7 (17.9)	0.002
0.10 – 0.19	30 (31.7)	32 (45.1)	56 (38.4)	15 (38.5)	
≥ 0.20	11 (13.1)	11 (15.5)	32 (21.9)	17 (43.6)	
csPCa (GG2)					
# (%)					
No	70 (83.3)	47 (66.2)	92 (63.0)	18 (46.2)	< 0.001
Yes	14 (16.7)	24 (33.8)	54 (37.0)	21 (53.8)	

Patient characteristics according to PI-RADS score

Predictors	Multivariable analysis	
	OR (95% CI)	p-value
Age	1.03	0.06
Number of positive cores at baseline	2.27	< 0.001
PSAD		
< 0.10	Ref	
0.10 – 0.19	1.40	0.25
≥ 0.20	3.0	0.001
PIRADS		
1-2	Ref	
3	1.92	0.18
4	2.04	0.11
5	3.43	0.02

At MVA, PSAD ≥ 0.20 (p=0.001; OR 3.0), PI-RADS 5 (p=0.02;OR 3.4) were associated with the higher risk of reclassification, together with the number of positive cores at baseline (p<0.001;OR 2.3).

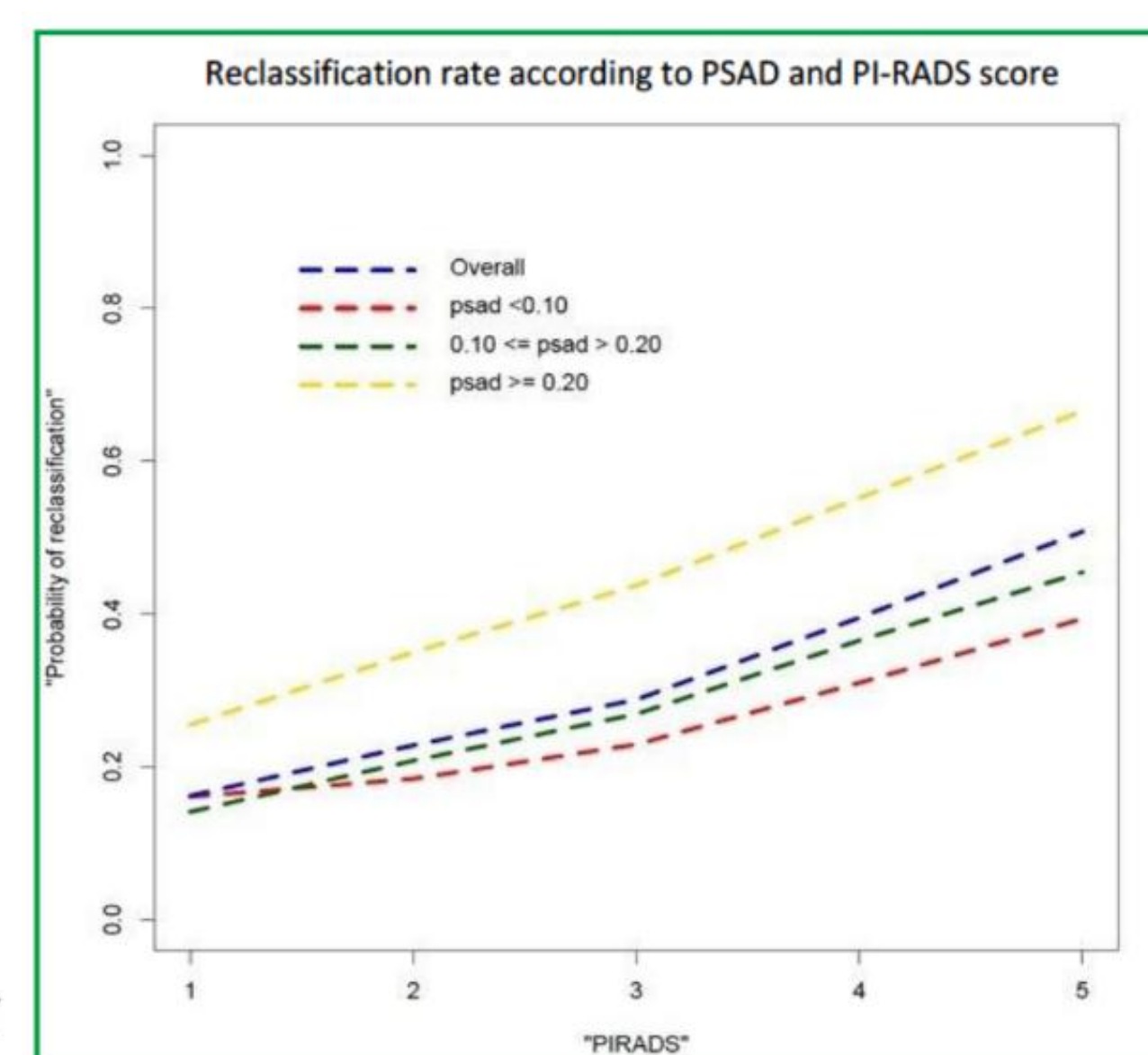


Fig.1 When we stratified to PSAD, in case of PSAD <0.10 the rate of reclassification was 16%, 22%, 31%, 40% for mpMRI(-),PI-RADS 3, 4 and 5, respectively. In case of PSAD ≥ 0.20 the rate of reclassification was 25%, 35%, 55%, 67% for mpMRI(-),PI-RADS 3, 4 and 5, respectively.

Conclusions:

PSAD ≥ 0.20 may improve predictive accuracy of mpMRI results for reclassification of low-risk PCa pts in AS. PSAD <0.10 may help selection of pts at lower risk of harboring csPCa, in the PI-RADS 3,4 and 5 groups. However, it should be highlighted that the risk of reclassification is not negligible at any PSAD cut-off value, also in case of mpMRI(-)