

Utility of PSA density for the selection of patients undergoing MRI before first prostate biopsy to optimize prostate cancer diagnosis

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Introduction & Objectives: Multiparametric magnetic resonance imaging (MRI) has entailed a great advance in prostate cancer (PC) diagnosis. In early stages of the disease, its appliance is limited due to monetary costs and waiting lists. For this reason, it is mandatory to carefully select patients who will undergo MRI. Our objective is to analyse PSA density (PSAd) and its association to clinically significant PC found in biopsy, in order to help us select patients for MRI.

Materials & Methods: Retrospective analysis of patients with a suspicious lesion found in MRI who underwent fusion guided prostate biopsy between January 2019 and August 2021. Three groups were established according to PSAd: PSAd < 0.1 (group 1), $0.1 \leq \text{PSAd} \leq 0.2$ (group 2) y PSAd > 0.2 (group 3). PSA, prostate volumen, size of MRI lesion, PI-RADS classification score, positive biopsies for PC and Gleason Grade groups were analysed.

Results: 186 patients underwent MRI/US fusion guided prostate biopsy, of which 59 (31.7%) were included in group 1, 84 (45.2%) in group 2 and 43 (23.1%) in group 3. Biopsy results, Gleason Grade groups and most frequent PI-RADS score found in MRI are detailed in the table below:

	Biopsy results		Gleason Grade group		PI-RADS score of MRI lesions	
	Positive	Negative	<2	≥ 2	4	5
Group 1	35 (59.3%)	23 (39.0%)	32 (54.2%)	27 (45.8%)	36 (61.0)	13 (22.0%)
Group 2	64 (76.2%)	19 (22.6%)	27 (32.1%)	57 (67.9%)	56 (67.5%)	22 (26.5%)
Group 3	34 (79.1%)	8 (18.6%)	12 (27.9%)	31 (72.1%)	27 (62.8%)	13 (30.2%)

PI-RADS 3 lesions accounted for less than 20% in all groups. Differences in PI-RADS scores between groups were not statistically significant ($p=0.233$). Positive biopsy results were found in a greater rate in groups 2 and 3 comparing to group 1, although these differences were not statistically significant ($p=0.139$). On the other hand, differences found in Gleason Grade groups (<2 and ≥ 2) between PSAd groups did reach statistical significance ($p=0.008$).

Conclusions: In our study, patients with PSA density ≥ 0.1 and suspicious lesion found in MRI have a higher risk of clinically significant prostate cancer. Therefore, if there is a need to optimize the use of diagnostic test for PC, these patients would have a higher benefit of MRI performance before prostate biopsy.