

## UTILITY OF MULTIPARAMETRIC MRI ADC VALUES IN ASSESSMENT OF PROSTATE CANCER GLEASON SCORE

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**Objectives.** One of the leading cancers in male population remains prostate cancer (PCa). Multiparametric magnetic resonance imaging (mp-MRI) has gradually taken on a large role in diagnosis of PCa. Studies on apparent diffusion coefficient (ADC) have shown improved accuracy in detection of clinically significant PCa (csPCa). The aim of this study was to evaluate if ADC values could be used to predict Gleason score (GS).

**Materials and Methods.** A retrospective analysis on 365 patients aged 47–79 years (from January 2019 to December 2022) who underwent a previous mp-MRI (1.5T) with PI-RADS v2.1  $\geq 3/5$  and a following histopathology diagnosis of GS  $\geq 6$  according to results of radical prostatectomy (RP). All suspected lesions were evaluated by certified radiologists and DWI ADC values in  $10^3 \text{ mm}^2/\text{s}$  were measured using b values 50 and 1000.

**Results.** Histopathology revealed clinically significant PCa in 278 patients (GS  $\geq 7$ ) and non-significant PCa (nsPCa) in 87 patients (GS  $\leq 6$ ). Data analysis demonstrated a characteristic distribution of value based on GS 6–10 (ADCmean  $\geq 0.867 \times 10^{-3} \text{ mm}^2/\text{s}$  for GS 6; ADCmean ranging from  $0.621 \times 10^{-3}$  to  $0.708 \times 10^{-3} \text{ mm}^2/\text{s}$  for GS 7; ADCmean  $\leq 0.558 \times 10^{-3} \text{ mm}^2/\text{s}$  for GS 8,9,10), with a very strong statistically significant negative correlation ( $r_s = -0.832$ ;  $P < 0.0001$ ). However, overlapping values in GS 6–7 groups in 4.8% cases were noted. ROC analysis displayed a significant correlation at ADC threshold value of  $0.790 \times 10^{-3} \text{ mm}^2/\text{s}$  ( $P < 0.0001$ , AUC = 0.980), with sensitivity 95%, specificity 91.7%, PPV 95%, NPV 90% and overall accuracy of 94%.

**Conclusions.** DC analysis shows prominent capability in defining tumor aggressiveness in clinically significant cancers (GS  $\geq 7$ ), which could assist as a dependable biomarker to grade suspected lesions and select patients for targeted biopsy. However, more studies are necessary as there is limitation of measurements in GS 6–7 groups.