Impact of changing PI‑RADS cutoff on prostate cancer detection by MRI cognitive fusion biopsy in biopsy‑naïve patients

HeshamAbdel‑AzimEl‑Helaly, Asem Abdel‑Aziz Mahmoud, AhmedMohamedMagdy2, Abdelwahab Hasehem3,4,5* , Hamdy Mohamed Ibrahim, Khaled Moheyelden Mohamed1 and Mohamed Hamdy Ismail1

Abstract

Background Multi‑parametric magnetic resonance imaging may improve the detection of prostate cancer. The aim of this work is to compare between PI‑RADS 3–5 and PI‑RADS 4–5 as a threshold for targeted prostatic biopsy.

Methods This is a prospective clinical study that included 40 biopsy‑naïve patients referred for prostate biopsy.

Patients underwent prebiopsy multi‑parametric (mp‑MRI), followed by 12‑core transrectal ultrasound‑guided system‑atic biopsy and cognitive MRI/TRUS fusion targeted biopsy from each detected lesion. The primary endpoint was to assess the diagnostic accuracy of the PI‑RAD 3–4 versus PI‑RADS 4–5 lesion by mpMRI for prostate cancer detection in biopsy‑naive men.

Results The overall prostate cancer detection rate and the clinically significant cancer detection rate were 42.5% and 35%, respectively. Targeted biopsies from PI‑RADS 3–5 lesions showed a sensitivity of 100%, specificity of 44%, positive predictive value of 51.7%, and negative predictive value of 100%. Restricting targeted biopsies to PI‑RADS 4–5 lesions resulted in a decrease in sensitivity and negative predictive value to 73.3% and 86.2%, respectively, while specific‑ ity and positive predictive value were increased to 100% for both parameters which was statistically significant (*P* value < 0.0001 and P value = 0.004, respectively). Conclusions Limiting the TBs to PI‑RADS 4–5 lesions improves the performance of mp‑MRI in the detection of pros‑ tate cancer especially aggressive tumors.

Keywords Prostate cancer, Biopsy, TRUS, Diagnosis, Oncology