Multiparametric magnetic resonance imaging-transrectal ultrasound fusion prostate biopsy: A prospective, single centre study.


Abstract

INTRODUCTION: Transrectal rectal ultrasound (TRUS)-guided systematic biopsy is the gold standard for diagnosis of prostate cancer. However, systematic biopsy has high false-negative rate and often misses anteriorly located tumors. Magnetic resonance imaging (MRI)-TRUS fusion biopsy can potentially improve cancer detection by better visualization and targeting of cancer focus. We evaluated the role of fusion biopsy in detection of prostate cancer and the association of prostate imaging reporting and data system (PI-RADS) score for predicting cancer risk and its aggression.

METHODS: Ninety-six consecutive men with suspected prostate cancer underwent MRI-TRUS fusion-targeted biopsy of suspicious lesions and standard 12 core biopsy from May 2014 to July 2015 in our institution. All patients underwent 3.0 T multiparametric MRI before biopsy. mp-MRI included T2W, DWI, DCE and MRS sequences to identify lesions suspicious for prostate cancer. Suspected lesions were scored according to PI-RADS scoring system. Comparison of cancer detection between standard 12 core biopsy and MRI-TRUS fusion biopsy was done. Detection of prostate cancer was primary end point of this study.

RESULTS: Mean age was 64.4 years and median prostate-specific antigen was 8.6 ng/ml. Prostate cancer was detected in 57 patients (59.3%). Of these 57 patients, 8 patients (14%) were detected by standard 12 core biopsy only, 7 patients (12.3%) with MRI-TRUS fusion biopsy only, and 42 patients (73.7%) by both techniques. Of the 7 patients, detected with MRI-TRUS fusion biopsy alone, 6 patients (85.7%) had Gleason ≥7 disease. Prostate cancer was detected on either standard 12 core biopsy or MRI-TRUS fusion biopsy in 0%, 42.8%, 74%, and 89.3% patients of suspicious lesions of highest PI-RADS score 2, 3, 4, and 5, respectively.

CONCLUSIONS: MRI-TRUS fusion prostate biopsy improves cancer detection rate when combined with standard 12 cores biopsy and detects more intermediate or high-grade prostate cancer (Gleason ≥7). With increasing PI-RADS score, there is an increase chance of detection of cancer as well as its aggressiveness.