Letters

COMMENT & RESPONSE

Magnetic Resonance Imaging–Based Prediction of Prostate Cancer Risk

To the Editor We read with great interest the article by Mehralivand et al.[1] The prediction of prostate cancer aggressiveness represents a major concern; from the previous Partin nomograms,[1] several predictive tools (PTs) have been developed to be applied in both the diagnostic and prognostic setting (ie, to distinguish clinically significant [CS] from indolent disease, to avoid unnecessary prostate biopsy or therapies), as well as in treatment planning, to tailor the procedure to the cancer's characteristics.[2]

Multiparametric magnetic resonance imaging (mpMRI) has gained widespread popularity; the electronic superimposition of mpMRI on transrectal ultrasound images led to the development of fusion biopsy, and the combination of targeted and standard biopsy seems superior to standard biopsy alone in capturing CS prostate cancer.[3]

In the present investigation, the authors[1] developed a PT for biopsy risk stratification, with the risk of Gleason score (GS) of at least 3 + 4 as the outcome measure of CS disease and the reduction of unnecessary biopsy as the end point. Beyond clinical predictors, the authors[1] included 2 MRI parameters, the MRI-derived prostate volume and Prostate Imaging Reporting and Data System (PI-RADSv2); they compared the so-derived PT to the one based on pure clinical covariates and, with a 20% threshold, MRI model had a lower rate of false-positive results than the baseline one with only a small reduction in the rate of true-positive results.

The authors should be recognized for the development of this valuable PT for biopsy risk stratification.[1] However, this model is based on GS prediction, but GS accounts for only 1 of the characteristics of low-risk prostate cancer. Because a high burden and bilateral GS 3 + 3 may not represent an insignificant cancer, the prediction of staging (beyond the pure grading) is essential to define the management of those prostate cancers. Clinical MRI staging, as a covariate, may depict this further end point.

Aside from this clinical concern, we believe that an epidemiologic comment should be added. The authors[1] performed an external validation on 2 different but concomitant cohorts from US academic centers. Despite different data sets, it may be speculated that those populations are similar to the development one, from a demographic and temporal viewpoint.

It is well known that, when used to analyze data sets from distant regions, several PTs show poor area under the curve at external validation; this was the case of Partin tables that, when externally validated in European countries, showed a poor predictive performance.[4] The generalizability of a PT is affected by geographic, temporal, and domain validations, which, therefore, may decrease the prediction in populations far from the development one.[5] In conclusion, this PT, like the former ones, before being applied in a novel cohort, should undergo an external validation to test the generalizability of the predictive rule in the new data set.

Giampaolo Bianchi, MD
Maria Chiara Sighinolfi, PhD, MD
Bernardo Rocco, MD

Author Affiliations: Department of Urology, University of Modena and Reggio Emilia, Modena, Italy.

Corresponding Author: Maria Chiara Sighinolfi, PhD, MD, Department of Urology, University of Modena and Reggio Emilia, Modena, Italy (sighinolfic@gmail.com).

Published Online: September 20, 2018. doi:10.1001/jamaoncol.2018.4221

Conflict of Interest Disclosures: None reported.

1. Mehralivand S, Shih JH, Rais-Bahrami S, et al. A magnetic resonance imaging–based prediction model for prostate biopsy risk stratification. *JAMA Oncol*. 2018;4(5):678-685. doi:10.1001/jamaoncol.2017.5667

2. Patel VR, Sandri M, Grasso AAC, et al. A novel tool for predicting extracapsular extension during graded partial nerve sparing in radical prostatectomy. *BJU Int*. 2018;121(3):373-382. doi:10.1111/bju.14026

3. Siddiqui MM, Rais-Bahrami S, Turkbey B, et al. Comparison of MR/ultrasound fusion-guided biopsy with ultrasound-guided biopsy for the diagnosis of prostate cancer. *JAMA*. 2015;313(4):390-397. doi:10.1001/jama.2014.17942

4. Bhojani N, Salomon L, Capitanio U, et al. External validation of the updated Partin tables in a cohort of French and Italian men. *Int J Radiat Oncol Biol Phys*. 2009;73(2):347-352. doi:10.1016/j.ijrobp.2008.04.082

5. Toll DB, Janssen KJM, Vergouwe Y, Moons KGM. Validation, updating and impact of clinical prediction rules: a review. *J Clin Epidemiol*. 2008;61(11):1085-1094. doi:10.1016/j.jclinepi.2008.04.008