Article Summary

*An integrated nomogram combining deep learning, Prostate Imaging–Reporting and Data System (PI-RADS) scoring, and clinical variables for identification of clinically significant prostate cancer on biparametric MRI: a retrospective multicentre study*

The purpose of the study was to determine the performance of an integrated nomogram (ClaD) that combined deep learning-based imaging predictions, PI-RADS scoring, and clinical variables when compared to nomograms that only combined two of these three variables when identifying significant prostate cancer on biparametric MRI. The implications of this study are accurate risk classification of patients who are at very low, low, or intermediate risk of prostate cancer.

Deep learning investigates convolutional neural networks to characterize prostate cancer and has been previously used to grade or distinguish between clinically significant and insignificant prostate cancer. These deep learning-based approaches have not been combined with PI-RADS assessment scores and other clinical factors for a clinical nomogram, which are tools used to assess risk of disease and outcomes of treatment.

The clinical variables used in this study were prostate-specific antigen, prostate volume, and lesion volume. These variables, in combination with a PI-RADS score (PIN) were used in conjunction with deep learning-based approaches to identify clinically significant prostate cancer lesions on biparametric MRI in 592 patients.

Analysis of data showed that deep learning-based approaches, PI-RADS score, along with the three clinical variables used were predictive of clinically significant prostate cancer. The integrated nomogram (ClaD) had a greater predictive accuracy than the clinical nomograms that integrated two of the three methods. Ultimately, the constructed integrated nomogram was concluded to possess the potential to categorize patients into very low, low, and intermediate risk categories for prostate cancer which will prevent unnecessary biopsies and to also highlight patients who are high risk for clinically significant prostate cancer with this group of people potentially benefiting from additional treatment.