Development and internal validation of a nomogram predicting the probability of prostate cancer Gleason sum upgrading between biopsy and radical prostatectomy pathology.


Abstract

OBJECTIVE: Previous reports indicate that as many as 43% of men with low grade PCa at biopsy will be diagnosed with high-grade PCa at RP. We explored the rate of upgrading from biopsy to RP specimen in our contemporary cohort, and developed a model capable of predicting the probability of biopsy Gleason sum upgrading.

MATERIALS AND METHODS: The study cohort consisted of 2982 men treated with RP, with available clinical stage, serum prostate specific antigen and biopsy Gleason scores. These clinical data were used as predictors in multivariate logistic regression models (LRM) addressing the rate of Gleason sum upgrading between biopsy and RP pathology. LRM regression coefficients were used to develop a nomogram predicting the probability of Gleason sum upgrading and was subjected to 200 bootstrap resamples for internal validation and to reduce overfit bias.

RESULTS: Overall, 875 patients were upgraded (29.3%). In multivariate LRMs, all predictors were highly significant (all p values <0.0001). Bootstrap-corrected predictive accuracy of the nomogram predicting the probability of Gleason sum upgrading between biopsy and RP was 0.804.

CONCLUSION: We developed a highly accurate clinical aid for treatment decision-making. It may prove useful when the possibility of a more aggressive Gleason variant may change the treatment options.

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