Predictive tools for prostate cancer staging, treatment response and outcomes.

[Article in English, Spanish]
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Abstract

OBJECTIVES: Numerous predictive models relating to prostate cancer staging and outcomes have been described. We sought to review and categorize these predictive tools to create a comprehensive reference for physicians who treat prostate cancer.

METHODS: We performed a search of MEDLINE literature from January 1966 to April 2012 to identify predictive models relating to prostate cancer staging, treatment, and outcomes in the pre-treated patient. For each model identified, we describe the outcome predicted, the variables comprising the model, the size of the cohort on which the tool was developed, predictive discrimination estimates, and whether internal and/or external validation has been performed.

RESULTS: We identified 80 predictive tools applicable to pre-treated prostate cancer patients, 30 of which had been externally validated. Tools designed to predict pathologic stage were the most common; several models focused on accurately predicting clinically insignificant prostate cancer while another large proportion focused on the prediction of locally advanced disease (i.e. extracapsular extension, seminal vesicle involvement, lymph node invasion). Other models described studied biochemical outcomes following radical prostatectomy, external beam radiotherapy, or brachytherapy. Very few models addressed the prediction of metastasis and survival. Finally, several tools incorporated novel pre-treatment serum biomarkers or magnetic resonance imaging findings into base models to enhance the accuracy of standard clinicopathologic variables.

CONCLUSION: To deliver optimal, individualized prostate cancer care, treatment should be tailored to the specific characteristics of each patient and each tumor. Predictive models may facilitate such an approach and are numerously described in the literature. While the performance of predictive models is encouraging, further improvement through inclusion of biomarkers as well as evaluation of their clinical utility is imperative. Optimally, predictive models should be further studied in the prospective setting.

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