

A model for predicting the individual probability of developing prostate cancer

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Using data from the Australian Risk Factors for Prostate Cancer (RFPC) case-control study, we adapted the Gail model for predicting prostate cancer risk. Odds ratios (ORs) for number of first-degree relatives with prostate cancer (family history), baldness status, and country of birth were estimated from the 1,441 cases and 1,389 controls in the study. Being bald (vertex or full baldness) and being born in Australia were associated with statistically significant ORs of 1.2 and 1.4, respectively. Estimates for family history were modified by the number of brothers in the family and the age of the proband. In particular, the increment in risk for family history ranged from 1.9 (age in the range 60-69 and only one relative affected in a family with at least four brothers) to about 35.9 (age less than 55 years and both father and the only brother affected). Cancer registry data allowed calculating prostate cancer incidence rates and mortality from competing causes. Independently of age and length of follow-up, the probabilities of developing prostate cancer for men with no more than one first-degree relative affected were all less than 10%. For men with more than one relative affected, these probabilities increased up to a maximum of around 20% (bald men aged less than 55 years with no more than one brother and born in Australia).

These results showed that age and a history of prostate cancer in first-degree relatives are the most important predictors of risk for the disease. Age, number of brothers affected, and total number of brothers in the family are significant modifiers of the effect of family history on prostate cancer risk.