Outcomes of Genetic Testing in a Genitourinary Genetics Clinic

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Several known hereditary cancer syndromes confer an increased risk for genitourinary (GU)-related malignancies. Various guidelines indicate when to refer patients to genetic counseling for GU-related hereditary cancer syndromes but there is limited research on the clinical picture of these patients, including their cancerous and non-cancerous features, the genetic testing strategy for this population, and the probability of having a positive germline mutation if testing is performed. The purpose of this study is to determine the most common indications for ordering genetic testing in a GU Genetics Clinic and evaluate whether there is a relationship between the indication for genetic testing and genetic testing outcome. An institutional review board-approved retrospective chart review was performed for 220 patients seen in a GU Genetics Clinic at MD Anderson Cancer Center. Patients were stratified into groups based on their indication for genetic testing and an exact binomial test was used to compare the proportion of patients with a positive genetic test from various groups. The majority of patients (92%) were seen for genetic evaluation related to either renal cell carcinoma (RCC) or prostate cancer. Among patients seen for RCC-related evaluation (n=107), meeting published clinical criteria for a hereditary RCC syndrome significantly predicted positive genetic testing ($P<0.001$). No other indication for testing, including early onset RCC (diagnosed $\leq 46$ years) predicted for positive genetic test results. Among patients seen for prostate-related evaluation
(n=101), 7 individuals tested positive for a hereditary syndrome related to prostate cancer, however none were identified by metastatic prostate cancer status alone. Our data suggest current algorithms lack sensitivity for selecting individuals with RCC or prostate carcinoma at risk for germline mutations. Evaluation of pedigree and identifying presence of syndromic features can guide risk assessment and increase the probability of identifying individuals with GU cancers at risk for harboring a germline cancer causing mutation.