Published in final edited form as:

Eur Urol. 2015 June ; 67(6): 1196–1197. doi:10.1016/j.eururo.2015.01.001.

Genitourinary Cancers Other than Prostate Cancer in a *BRCA*-tested Cohort from a Single Institution

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Genitourinary malignancies have well-known hereditary components, and *BRCA* gene mutations have been implicated in the etiology of many malignancies including prostate cancer [1,2]. We describe here patient and disease characteristics related to genitourinary malignancies other than prostate cancer in a large *BRCA*-tested cohort from the clinical genetics service at the Memorial Sloan Kettering Cancer Center. Between 1996 and 2012, 6830 patients were tested for *BRCA1* and *BRCA2* mutations and were enrolled in an study approved by the Institutional Review Board. Patients with genitourinary malignancies were identified, and demographic data and disease characteristics were collected at the time of testing. Simple frequencies and Fisher exact tests were used to examine differences in the prevalence of genitourinary malignancies between carriers and noncarriers of *BRCA* mutations. Of the 6830 patients examined, 1297 (18.9%) were carriers of *BRCA* mutations. The carriers were mainly white (93%) and female (91%), and 43% were Ashkenazi Jews. The noncarriers were mainly white (91%) and females (95%), and 35% were Ashkenazi Jews. At the time of testing, seven (0.5%) and 13 (0.2%) patients had a history of genitourinary malignancy in the *BRCA* carrier and noncarrier cohorts, respectively. Bladder cancer affected three *BRCA* mutation carriers (two *BRCA1* and one *BRCA2* mutations) and nine noncarriers, kidney cancer affected three carriers (all *BRCA1* 185delAG mutation carriers) and two noncarriers, and testis cancer affected one carrier (5382incC *BRCA1* mutation) and two noncarriers. The percentage of genitourinary cancers did not significantly differ between *BRCA* mutation carriers and noncarriers by cancer type (two-tailed *p* value 0.8 for bladder, 0.1 for kidney, and 0.08 for testis). A subset analysis by mutation showed that kidney cancer was significantly associated with the *BRCA1* Ashkenazi Jewish founder mutation (185delAG) (odds ratio 12.71, 95% confidence interval 1.453–152.4; *p* = 0.02). However, there was no loss of heterozygosity for 185delAG in tumor tissue available from one of the mutation carriers affected by kidney cancer. Limitations are the retrospective nature of the data and the small number of genitourinary malignancies; however, this cohort

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Conflicts of interest: The authors have nothing to disclose.

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Acknowledgments

Funding support: This work was supported by the Sidney Kimmel Center for Prostate and Urologic Cancers.

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Take Home Message

We did not find a significant difference in the prevalence of genitourinary malignancies other than prostate cancer between carriers and noncarriers of *BRCA* gene mutations. Our study cohort could be considered representative of large centers experienced in this field, especially for Ashkenazi Jewish patients.

Fig. 1.
(A1,2) Absence of loss of heterozygosity of *BRCA1* mutation 185delAG in tumor tissue from a mutation carrier affected by kidney cancer. (B) Kidney cancer tumor tissue showing expression of *BRCA1* (inset, top right).