



Clinical significance of fibroblast growth factor receptor-3 mutations in bladder cancer: a systematic review and meta-analysis

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Genet. Mol. Res. 13 (1): 1109-1120 (2014)

Received February 25, 2013

Accepted July 26, 2013

Published February 20, 2014

DOI <http://dx.doi.org/10.4238/2014.February.20.12>

ABSTRACT. Mutations in the fibroblast growth factor receptor-3 (*FGFR3*) gene are frequently found in bladder cancer, but their prognostic value remains controversial. To globally summarize the association between *FGFR3* mutations and the grade and stage of bladder cancer, and to analyze the predictive role of *FGFR3* mutations with respect to survival, eligible studies were identified and assessed for quality through multiple search strategies. Risk ratio (RR) data were collected from studies comparing the number of *FGFR3* mutants among low-grade and early-stage bladder cancer patients to the number among high-grade and late-stage patients. Hazard ratio (HR) data were collected from studies comparing survival in patients with mutant *FGFR3* genes to those with wild-type genes. Studies were pooled, and the RRs of grade and stage and the HRs of survival were

calculated. Thirty studies were included in the present meta-analysis. *FGFR3* mutations were found to be closely associated with low-grade and early-stage bladder cancer, showing pooled RRs = 2.948 [95% confidence interval (CI) = 2.357-3.688] and 2.845 (95%CI = 2.145-3.773), respectively. Notably, patients with *FGFR3* mutations tended to show better disease-, progress-, and recurrence-free survival (HR = 0.561, 95%CI = 0.405-0.779), and better disease-specific survival (HR = 0.363, 95%CI = 0.266-0.496). This study demonstrated that *FGFR3* mutations are closely related to low grade, early stage, and better survival among bladder cancer patients.

Key words: FGFR3; Bladder cancer; Prognosis; Grade; Staging