Genetic polymorphisms in NQO1 and SOD2: interactions with smoking, schistosoma infection, and bladder cancer risk in Egypt.


Abstract:

BACKGROUND: Bladder cancer is the most prevalent form of cancer in men among Egyptians, for whom tobacco smoke exposure and Schistosoma haematobium (SH) infection are the major risk factors. We hypothesized that functional polymorphisms in NAD(P)H: quinone oxidoreductase 1 (NQO1) and superoxide dismutase 2 (SOD2), modulators of the effects of reactive oxidative species, can influence an individual's susceptibility to these carcinogenic exposures and hence the risk of bladder cancer. METHODS: We assessed the effects of potential interactions between functional polymorphisms in the NQO1 and SOD2 genes and exposure to smoking and SH infection on bladder cancer risk among 902 cases and 804 population-based controls in Egypt. We used unconditional logistic regression to estimate the odds ratios (OR) and confidence intervals (CI) 95%. RESULTS: Water pipe and cigarette smoking were more strongly associated with cancer risk among individuals with the TT genotype for SOD2 (OR [CI 95%] = 4.41 [1.86-10.42]) as compared with those with the CC genotype (OR [CI 95%] = 2.26 [0.97-6.74]). Conversely, the risk associated with SH infection was higher among the latter (OR [CI 95%] = 3.59 [2.21-5.84]) than among the former (OR [CI 95%] = 1.86 [1.33-2.60]). Polymorphisms in NQO1 genotype showed a similar pattern, but to a much lesser extent. The highest odds for having bladder cancer following SH infection were observed among individuals with the CC genotypes for both NQO1 and SOD2 (OR [CI 95%] = 4.41 [2.32-8.38]). CONCLUSION: Our findings suggest that genetic polymorphisms in NQO1 and SOD2 play important roles in the etiology of bladder cancer by modulating the effects of known contributing factors such as smoking and SH infection.

Keywords:

Bladder cancer; Epidemiology; NQO1; SOD2; Schistosomiasis; Smoking

Published In:

Urol Oncol , Vol.32,No.1 ,