Strong association between long and heterogeneous telomere length in blood lymphocytes and bladder cancer risk in Egyptian

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Abstract:

Although it is widely recognized that telomere dysfunction plays an important role in cancer, the relationship between telomere function and bladder cancer risk is not well defined. In a case–control study of bladder cancer in Egypt, we examined relationships between two telomere features and bladder cancer risk. Telomere fluorescent in situ hybridization was used to measure telomere features using short-term cultured blood lymphocytes. Logistic regression was used to estimate the strength of association between telomere features and the risk of urothelial carcinoma of the bladder. High telomere length variation (TLV) across all chromosomal ends was significantly associated with an increased risk of bladder cancer [adjusted odds ratios (OR) = 2.22, 95% confidence interval (CI) = 1.48–3.35], as was long average telomere length (OR = 3.19, 95% CI = 2.07, 4.91). Further, TLV and average telomere length jointly affected bladder cancer risk: when comparing individuals with long telomere length and high TLV to those with short telomere length and low TLV, the adjusted OR was 14.68 (95% CI: 6.74–31.98). These associations were stronger among individuals who are 60 years of age or younger. In summary, long and heterogeneous telomere length in blood lymphocytes was strongly associated with an increased bladder cancer risk in Egyptian and the association was modulated by age.

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