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Higher fitness is associated with improved survival among cancer patients

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Topic(s):
Prevention: Physical Inactivity

Citation:
Background: Cardio-respiratory fitness (CRF) is a known predictor of cardiovascular morbidity and mortality. However, data on the association of CRF with survival following a diagnosis of cancer is limited.

Purpose: To evaluate the association between CRF in a large cohort of asymptomatic adults and a probability of survival after subsequent cancer diagnosis.

Methods: We evaluated asymptomatic self-referred adults aged 40-79 years who were screened annually at a tertiary medical center. All subjects were free of cardiovascular disease and cancer at baseline and completed maximal exercise stress test according to the Bruce protocol. Fitness was categorized into age- and sex-specific quintiles (Q) according to Bruce protocol treadmill time with Q1-Q2 defined as low fitness and Q3-Q5 as higher fitness. Cancer data was available from a national cancer registry. The primary end point was all-cause mortality.

Results: Final study population in included 15,800 subjects. Mean age was 51±8 years and 72% were men. During median follow up of 13 years (IQR 7-16) 1,312 (8%) subjects developed cancer and 486 (3%) died. Most common cancer types were prostate in 302 (23%) and breast cancer in 189 (14%) patients. No difference was found in distribution of major cancer types between different fitness categories. Univariate Cox regression with cancer as a time dependent covariate showed that subjects who developed cancer during follow up were 19 times more likely to die (95% CI 15.5-22.5, p<.001). Kaplan Meier analysis showed that the cumulative probability of death from the time of cancer diagnosis was significantly lower among high fitness patients (34% ± 4% vs. 25% ± 3%, p Log rank =.008; Figure 1). Multivariate interaction analysis with cancer as a time dependent covariate showed that cancer-related risk of death was fitness-dependent, such that in the lower fitness group cancer was associated with 18 folds increased risk of death (95% CI 13.5-23) whereas among high fitness group the risk of death was lower (HR=13; 95% CI 10-17; p for interaction = .048).

Conclusions: Low CRF is associated with worse survival among subjects diagnosed as having cancer during follow up. These findings support the effectiveness of fitness assessment in preventive health care settings.
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