Associations of cardiometabolic multimorbidity with risks of lung cancer and competing mortality: A population-based prospective cohort study

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ABSTRACT

Introduction: Lung cancer is the most commonly diagnosed cancer worldwide. Screening has been found to reduce lung cancer mortality in randomized controlled trials. However, in real-world settings, there is a high prevalence of cardiometabolic multimorbidity (CMM), which may influence the balance between benefits and harms of lung cancer screening. We aimed to compare the impact of CMM on the risk of lung cancer against competing mortality. **Materials and Methods:** This study included 512,592 participants free of lung cancer at baseline from the China Kadoorie Biobank. CMM was defined as the coexistence of at least two cardiometabolic diseases, including hypertension, diabetes, coronary heart disease (CHD), and stroke. We applied multi-state models to simultaneously estimate hazard ratios (HRs) of CMM on lung cancer incidence and competing mortality, and the comparative HRs for competing mortality relative to lung cancer incidence. **Results:** With a median follow-up of 10.1 years, 4,606 participants were diagnosed with lung cancer, and 39,724 participants died of other causes. Overall, CMM was associated with an increased risk of transition from baseline to lung cancer incidence (HR: 1.11, 95%CI: 1.00-1.23), and from baseline to competing mortality (HR: 2.35, 95%CI: 2.29-2.41), with comparative HRs of 2.12. All CMM patterns increased the risk of competing mortality, with HRs ranging from 2.3 (hypertension & CHD) to 7.4 (four diseases co-exist). Participants with at least the combinations of hypertension & diabetes, hypertension & CHD, or CHD & stroke had higher risk of LC, with HRs varying from 1.2 to 2.8. The comparative HRs ranged from 1.6 (CHD & Stroke) to 5.1 (hypertension & diabetes & stroke). **Conclusion:** The risk of competing mortality associated with CMM was much higher than that of lung cancer. Personalized screening and nuanced communication are needed among patients with cardiometabolic multimorbidity.

Keywords: Lung cancer, competing mortality, cardiometabolic multimorbidity, prospective cohort