The Health Technology Report Series has been developed by the Institute of Family Medicine and Public Health, University of Tartu.

Screening for lung cancer

Summary

Lung cancer is the leading cause of cancer-related death among men globally and one of the top three causes of cancer mortality among women. Only 15% of patients with lung cancer are still alive 5 years after diagnosis, because approximately 70% of patients have advanced disease at the time of diagnosis. However, persons with early lung cancer have lower cancer-related mortality than those with extensive disease, suggesting early detection and treatment of lung cancer might be beneficial. Low-dose computed tomography (LDCT) has been studied for early screening.

Objectives: The aim of this health technology assessment was to analyse the health benefits and costs of using LDCT in screening of lung cancer, and to estimate the budget impact of the interventions from the perspective of Estonian Health Insurance Fund.

Methods: A systematic review of randomized, controlled trials or cohort studies, that evaluated screening or treatment interventions for lung cancer and reported health outcomes was conducted. In parallel, a systematic review of cost-effectiveness studies was conducted about the use of LDCT in screening for lung cancer.

Results: The meta-analysis of good-quality trials established that the relative risk of lung cancer mortality was 0.81 (95% CI, 0.72 to 0.91) if LDCT was used in screening for lung cancer in high risk populations. LDCT screening can save approximately 5 out of 1,000 individuals (95% CI 3–8) from dying of lung cancer within approximately 10 years. False-positive screening results lead to invasive procedures that would not have been performed without the screening in at least 1 in 1,000, but at most 15 in 1,000 individuals.

Majority of cost-effectiveness studies on the use of LDCT in screening for lung cancer estimated that the cost was less than 40 000 euros per QALY gained.

Good evidence shows LDCT can significantly reduce mortality from lung cancer. However, there are significant harms associated with screening that must be balanced with the benefits. More efforts to reduce false-positive examinations are of paramount importance and smoking cessation remains the most important approach to reducing lung cancer mortality.

Conclusions: Implementation of LDCT-based screening should be considered at a population level. Persons at risk of lung cancer should be evaluatued according to personal smoking exposure, family history and other factors, to determine subsequent follow-up. Low-dose computed tomography should be used to determine which persons need biopsy and how any cancers should be treated.

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