Novel Approaches to Lung Cancer Screening

S128 LUNGSEARCH: A RANDOMISED CONTROLLED TRIAL OF SURVEILLANCE FOR THE EARLY DETECTION OF LUNG CANCER IN A HIGH RISK GROUP

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Screening for the early detection of lung cancers should increase the percentage of operable tumours, thus improving cure rates. A large randomised US trial showed that CT screening moderate/heavy smokers is effective but expensive, with a high false-positive rate. We designed LungSEARCH in 2006 to target screening in higher-risk subjects. Because most tumours in the UK were of squamous-histology, we hypothesised that sputum cytology plus cytometry would be an effective initial screen, only offering more intensive/expensive tests to those with abnormal sputum.

Eligibility criteria were: current/former smokers (≥20 pack-years and/or smoked ≥20 years), GOLD-defined COPD, no prior cancer. Subjects were randomised to surveillance or a control group, and each followed for 5 years. Screened subjects provided sputum for central assessment, and those with abnormal results (cytology: low/high-grade squamous intraepithelial lesions, and/or cytometry: abnormal ploidy) were referred for annual low-dose CT and autofluorescence bronchoscopy (AFB) for the remainder of the trial, with diagnostic investigations when cancer suspected by abnormal CT/AFB. Sputum-negatives provided annual sputum samples only. Control subjects had a chest X-ray when they reached 5 years. Primary objective: to show a higher proportion of early stage cancers using surveillance than controls.

1568 subjects were recruited (target 1300) from GPs or chest clinics around 10 UK centres (August 2007–March 2011): 785 screened, 783 controls. Mean age 63 years; males 52%; current (56%), former (44%) smokers; mild (25%), moderate (75%) COPD; from GPs (79%). >90% screened subjects provided sputum samples in their first year. After 5 years, the overall sputum-positive rate is 33%; 30% (236/785) had a CT scan and 25% (193/785) had an AFB at any time. Of those who had a CT scan 19% (45/236) were abnormal (lung nodule(s) ≥9 mm); and of those who had AFB 3% (5/193) had severe dysplasia or worse.

79 lung cancers have been identified to date via the centres/national registry: 43 surveillance and 36 control. But awaiting staging details for 6 surveillance and 14 control cases. Preliminary results are promising: 57% (surveillance) versus 41% (controls) of cancers were diagnosed with stage I/II non-small-cell-lung cancer or limited disease small-cell-lung cancer. Final data available later in 2016.

S129 WHAT PROPORTION OF PATIENTS WITH LUNG CANCER WOULD HAVE BEEN ELIGIBLE FOR CT SCREENING ACCORDING TO VARIOUS PROPOSED INCLUSION CRITERIA?

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Abstract The US National Lung Screening Trial (NLST) identified persons for lung cancer screening by age (55–74 yrs) and smoking history, but a subsequent analysis of the US SEER database showed that only 26.7% of lung cancer cases would have been eligible for screening according to these criteria.

Strategies to increase the proportion of lung cancer patients who might qualify for screening include increasing the upper age limit to 80 years (endorsed by the US Preventative Services Task Force – USPSTF), and using composite lung cancer risk prediction tools. The UK Lung Screening pilot (UKLS) used the Liverpool Lung Project score (LLP) to identify patients for screening. In a validation cohort from the US Prostate, Lung, Colorectal and Ovarian study, a threshold based on the $PLCO_{M2012}$ score identified more cancers than the NLST criteria. We prospectively compared these criteria for the first time in patients presenting with lung cancer in Yorkshire.

Methods We audited the proportion of patients presenting with lung cancer through fast-track clinics at 4 Yorkshire centres who would have been eligible for screening according to the following

Abstract S129 Table 1 The numbers and proportions of lung cancer patients who would have been eligible for CT screening according to various inclusion criteria

Criteria	Descriptor	Number of eligible patients	Proportion of all lung cancer patients	Proportion of 55–80yrs ever-smoking patients
NLST	Age 55–74, ≥30 pack years smoking, quit time <15 years	71	34.5%	51.1%
USPSTF	Age 55–80, ≥30 pack years smoking, quit time <15 years	89	43.2%	64.0%
UKLS	Age 50–75, ≥5% lung cancer risk by LLPv.2	67	32.5%	48.2%
PLCO ≥1.51%	Age 55–80, ≥1.51% lung cancer risk by $PLCO_{M2012}$	111	53.9%	79.9%
LLP ≥5%	Age 55–80, ≥5% lung cancer risk by LLPv.2	94	45.6%	67.6%