Second and higher order smoking-related primary cancers following lung cancer: a population-based cohort study

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Declarations

- None
Trends in one- and five-year net survival from lung cancer in England; 1995 – 2014*

Objectives

1. Describe the incidence and patterns of second primary cancers following first primary lung cancer
2. Evaluate whether the incidence of second primary cancer is higher than in the normal population
3. Does incidence change over time?
Dataset

- All patients diagnosed in England with first primary smoking-related cancer between 2000-2014
  - lung, head and neck, laryngeal, oesophageal squamous cell carcinoma and bladder

- Requested data on all subsequent registrations of a second smoking-related primary cancer
  - Cases classified as recurrence of first primary were excluded
490,328 patients diagnosed with first primary lung cancer between 2000 and 2014, with a maximum of 15 years follow-up
- 88% non-small-cell lung cancer; 12% small cell lung cancer

We excluded second primary cancers diagnosed within 6 months of the first primary cancer as they were deemed to represent synchronous diagnoses.

Focused on 213,245 (43%) surviving six months
- 2,328 (1.1%) second or higher order smoking-related primary cancers
Incidence of second primary cancer

Describe incidence of second primary cancers following first primary lung cancer

Methods:
- Stratify data by age at diagnosis of first primary and by sex
- Divided follow-up into 6-month periods
- Calculate the number of patient-years and observed second primary cancers in each period
- Smooth trend over follow-up using restricted cubic splines
- Use Poisson regression with patient-years as exposure to model incidence rates
Absolute incidence of second smoking-related primary cancers after lung cancer

Incidence rates stable or increasing beyond end of routine 5 year follow-up
Standardised incidence rate ratios

Evaluate whether risk of SPC is higher than expected in general population

- We estimated the number of cancers we would expect in people without lung cancer for each age group/sex

- We compared the number of observed and expected cancers to calculate the SIR ratios
Standardised incidence rate ratios for second smoking-related primary cancers
SIR ratios for second primary cancers (after lung) by site of second primary
Changing incidence of SPC by year of first primary lung cancer diagnosis

A. Unadjusted

B. Adjusted for age, deprivation, sex and elapsed follow-up
Strengths and limitations

- Strengths:
  - Very large population-based cohort, allowing flexible investigation of risk of second and higher order primary cancers despite poor survival rates

- Limitations:
  - Prior to 2012:
  - No information on smoking status
  - No information on treatment
  - Limited information about tumour details e.g. stage
Summary

- Lung cancer survivors, particularly women, have an increased incidence of smoking-related primary cancers for at least a decade after their first lung cancer.

- Those aged 50-79 at first diagnosis are at particularly high risk.

- Incidence rates of SPCs continue to rise beyond the end of routine 5 year follow up – approx. 1.5% p.a. between years 5 to 10.

- SIR ratios are increasing for second primary lung cancer.

- *Should we be extending routine follow up/surveillance from 5 to 10 years particularly for those aged 50-79 at first diagnosis?*

In press Thorax 2019
Development and treatment of fresh lung carcinoma after successful lobectomy

R. ABBEY SMITH

From King Edward VII Chest Hospital, Hertford Hill, nr. Warwick

*Close follow-up of all patients treated surgically for lung carcinoma has been carried out. The

METHOD OF FOLLOW-UP

Thorax 1966