Factors involved in the improved survival for patients with lung cancer in south-east Scotland

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Introduction

Despite a welcome fall in the prevalence of tobacco use among adults in the UK since the 1950s, the number of people who still smoke, combined with the long latent period between exposure to smoking and disease onset, means that lung cancer remains a major public health issue. In the UK during 2005, around 38,500 new cases of lung cancer were diagnosed and just over 33,000 people died from the disease. The relatively high ratio of deaths to incident cases betrays the usually poor prognosis associated with lung cancer – in the UK, less than 10% of patients live beyond five years from diagnosis.

On the face of it, survival from lung cancer in the UK does not compare favourably with some other countries in Europe (figure 1). Although there are many possible reasons for observed variations in survival from cancer between countries (table 1), it is a cause for concern that survival from lung cancer appears to be lower in the UK than in some of the Nordic countries, which have an excellent reputation for cancer data quality and completeness of case ascertainment.

Some years ago, an observational study covering the territory of the Northern and Yorkshire Cancer Registry showed that, on average, health districts with higher levels of active treatment for lung cancer had better survival figures. Several previous audits of lung cancer management in Scotland have demonstrated variations in use of active treatment for lung cancer. Taken together, these observations raise the possibility that there might be scope for improvement in the delivery of lung cancer services in the UK.

It was against this background that Dr Sara Erridge, a senior lecturer and honorary consultant in clinical oncology at the Western General Hospital, Edinburgh, set out, along with colleagues, to investigate whether survival from lung cancer in her catchment area (south-east Scotland) had improved as a result of recent changes in the organisation and delivery of services for patients with lung cancer.

These changes are summarised in table 2.

The study population

The South-East Scotland Cancer Network (SCAN) covers a population of 1.4 million spread across four NHS Board areas: Lothian, Fife, Dumfries & Galloway, and Borders. All radiotherapy is delivered at the Edinburgh Cancer Centre, which in 1995 had four, and in 2002 five, linear accelerators. Most chemotherapy is delivered under the supervision of an oncologist, although some was still being administered by respiratory physicians in 2002. Lung cancer surgery is performed at the Royal Infirmary, Edinburgh, but patients living in Dumfries & Galloway usually have their surgery performed in Glasgow. Therefore, for this study, it was decided to include only patients from Lothian, Fife and Borders (population 1.2 million).

The baseline study cohort from Lothian, Fife and Borders was derived from the 1995 national audit of lung cancer management, itself derived originally from the population-based Scottish Cancer Registry, which is believed to hold data of relatively high quality, both in terms of reliability and completeness of case ascertainment. A more recent...
numbers of patients had to be excluded from each cohort because medical records could not be obtained (67 patients from the 1995 cohort and 56 patients from the 2002 cohort). There were no differences between the sex or age distributions of these two groups of excluded patients.

Investigation and management

A significantly higher proportion of patients underwent a staging CT scan in 2002 compared with 1995 (85% versus 46%, P<0.001). This may explain the apparently lower proportion of patients diagnosed with localised disease in 2002 (14% versus 25%) and the higher proportion of patients with metastatic disease (42% versus 30%).

The overall proportion of patients receiving treatment did not increase over time; in 1995, 63% received some form of treatment compared with 62% in 2002. However, the proportion of patients treated with curative intent increased significantly from 14% to 24% (P<0.001), primarily because of a tripling of the number of patients treated with potentially curative radiotherapy (5% increasing to 15%, P<0.001). This may explain the apparently lower proportion of patients receiving chemotherapy (7% increasing number of patients receiving chemotherapy increased, for their lung cancer (10.2% versus 10.5% of all cases, and 4.7% versus 6.0% of patients with lung cancer treated in the UK, 1995-2002). This demonstrated that, even after differences in age and stage of disease were taken into account, patients diagnosed in 2002 had an adjusted hazard ratio of death of 0.7 (0.6-0.8) compared with patients diagnosed in 1995. When the model was repeated with the addition of the variable, 'treatment intent' (potentially curative versus palliative versus none), the hazard of death was still lower in 2002 compared with 1995 (0.8, 0.7-0.9) suggesting that the improvement in outcome was not solely due to increased application of potentially curative treatments. Between 1995 and 2002, there was a slight decline in the median survival of patients undergoing palliative radiotherapy (5.2 to 4.4 months), probably reflecting changes in patient selection.

An alternative explanation for the observed improvement in survival from lung cancer over time is the trend for increasing life expectancy in Scotland. This was explored by calculating relative survival, which takes account of changes in life expectancy and effectively focuses on survival from lung cancer alone. Relative survival from lung cancer was also found to have increased between 1995 and 2002.

Conclusions

Despite diligent efforts to assemble a truly population-based study devoid of selection bias, it is very difficult, using observational data, to attribute a change in outcome to an intervention, especially when the intervention is not clearly circumscribed and the outcome (survival) is influenced by such a multitude of potential confounding factors.

One important factor missing from this study is information on comorbidity, although previous studies from the Netherlands suggest that the independent impact of comorbidity on survival from lung cancer is more limited than might be imagined. At the same time, it could be argued that the calculation of relative survival, which takes account of life expectancy, makes some allowance for differences in comorbidity because populations with shorter life expectancy are presumably more likely to experience higher levels of comorbidity.

In summary, the results of this study suggest that survival from lung cancer in south-east Scotland did increase between 1995 and 2002, and it seems likely that this improvement in prognosis was related, at least in part, to enhancements in the organisation and delivery of care.

REFERENCES


13, http://www.scan.scot.nhs.uk/