High procedure volume is associated with improved survival after lung cancer surgery

NCIN Data Briefing

KEY MESSAGE:

High volume hospitals have higher resection rates, operate on patients who are older, have lower socioeconomic status, more comorbidities and despite that they achieve better survival, most notably in the early post-operative period.

Introduction

Surgical resection is the first line-treatment for non-small cell lung cancer patients with early stage disease and who are considered medically fit. We explored whether there is a survival benefit among patient undergoing surgery for lung cancer in hospitals in England where high numbers of lung cancer resections are carried out.

Methods

Data on 134,293 patients diagnosed with non-small cell lung cancer in England between 2004 and 2008 were identified from the National Cancer Data Repository and information on surgical resections and comorbidity was obtained from linked inpatient and day-case episodes recorded in the Hospital Episode Statistics database. Hospital volume was defined as the number of lung cancer patients undergoing surgical resection in each NHS hospital trust in each diagnosis year, and grouped into five similarly sized categories: <70, 70-99, 100-129, 130-149 and 150+ procedures per year. Multivariable Cox proportional hazards hazard ratios (HRs) were calculated according to hospital volume and adjusted for potential confounders (age, sex, socioeconomic deprivation, comorbidity, and the propensity to operate) in three pre-defined time periods (0-30, 30-365 and 365+ days after surgery).

Results

Higher-volume hospitals have higher resection rates, and included a higher proportion of older patients undergoing surgery, relatively greater numbers of patients from more deprived areas, as well as relatively higher numbers of patients with comorbidity.

Figure 1 shows that increasing hospital volume was associated with lower mortality. Compared with hospitals performing less than 70 surgical procedures per year, hospitals carrying out more were all associated with decreased mortality, but the magnitude of the association was similar in the range of hospital volume from 70 to 149 procedures per year and strongest among hospitals carrying out more than 150 procedures.

Figure 2 shows that the extreme contrast between the lowest- and highest volume was statistically significant in all three periods of post-surgical follow-up. The magnitude of association was greatest in the first 30 days after surgery and smallest in the period more than 365 days after surgery.

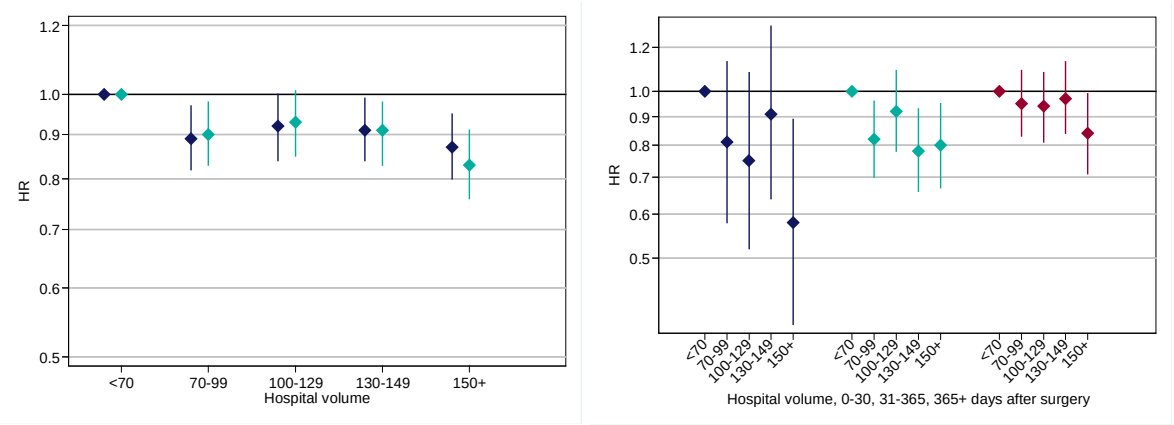

Figure 1: HRs and 95% CIs according to hospital volume, adjusted for age and sex (blue); and age, sex, socioeconomic deprivation, comorbidity, and the propensity to operate (green).

Figure 2: HRs and 95% CIs according to hospital volume by period of follow-up (0-30 (blue), 31-365 days (green) and >365 days (red)).

Conclusion

These results indicate that hospitals in England with high volumes of surgical resection of lung cancer perform surgery among patients who are older, are more socioeconomically deprived, and have more comorbidity. Despite this, they achieve better survival, especially in the early postoperative period.

Acknowledgment

This work is taken from the following publication: High procedure volume is strongly associated with improved survival after lung cancer surgery. Lüchtenborg M, Riaz SP, Coupland VH, *et al*. J Clin Oncol 2013;31(25):3141-6.

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Public Health England

The London Knowledge and Intelligence Team is the lead for lung cancer and mesothelioma

www.gov.uk/phe

The National Cancer Intelligence Network (NCIN) is a UK-wide partnership operated by Public Health England. The NCIN coordinates and develops analysis and intelligence to drive improvements in prevention, standards of cancer care and clinical outcomes for cancer patients.