Lung Cancer and Aortic Aneurysms: Evidence for an Inherent Linkage

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Background: Lung cancer and aortic aneurysms possess multiple shared risk factors including increasing age and smoking history. While there are screening guidelines in place for both conditions, they vary in methodology (low-dose chest CT scan vs abdominal ultrasound) despite having significant overlap in the patient populations screened. The focus of this study involved demonstrating a close connection between the patient populations of both lung cancer and aortic aneurysms in order to suggest a change in the process in which we screen for these conditions.

Methods: After obtaining IRB approval, ICD codes were used to query the SBUH patient database for all patients diagnosed with lung cancer within the past 15 years. Data regarding demographics and various risk factors was obtained, and patients’ original whole-body PET-CT scans were re-read for measurements of the thoracic and abdominal aorta. A group of age- and risk-factor-matched controls with CT scans done for reasons other than cancer surveillance was obtained for use in descriptive statistics.

Results: A total of 814 patients with lung cancer were included in the study. A total of 90 patients (11.1%) had evidence of AAA, compared to a prevalence of 2% in the control group (p = 0.0023). - 12% had aneurysms that required treatment* - Patients with a history of smoking were more likely than non-smokers to have a AAA (11.9% vs 2.2%, p = 0.0021). - A majority of AAA patients (76.6%) had early stage lung cancer (1 or 2). - Women in this patient population had a strikingly high prevalence of AAA (5.3%).

Conclusion: Patients with lung cancer have a high prevalence of AAA (~11%). Smokers are more likely than non-smokers to have AAA, insinuating that lung cancer and AAA affect similar patient populations. This data may help lead to changes in AAA screening that can reduce morbidity and mortality from AAA.

Future Direction: Further prospective studies should focus on examining the survival benefit of screening for AAA at the same time as lung cancer screening.

If a reduction in mortality is shown in such studies, changes in screening guidelines should be made to include screening for AAA in populations not currently screened, which includes women and non-smokers.

Simultaneous screening for lung cancer and AAA can easily be achieved by extending the low-dose CT scan into the abdomen.

Long Hypothesis (PICO criteria)

- Because smoking is a common risk factor for both lung cancer and aortic aneurysms, and there has been a documented association between AAA and other lung disease, patients with lung cancer may possess a higher prevalence of AAA compared to age- and risk-factor-matched controls.
- If so, might changes in screening strategies prevent morbidity and mortality from AAA?

LUNG CANCER SCREENING CRITERIA
- Patients must be:
  - 55-80 years old
  - Currently smoke or have quit in the past 15 years
  - Have at least a 30 pack-year history

AAA SCREENING CRITERIA
- Patients must be:
  - Male
  - 65-75 years old
  - Have a smoking history

Source: USPSTF

Logistic Regression Analysis*

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Further Readings/Citations