

Optimal care pathways for lung cancer in South West Victoria

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Abstract

Aim This study reports on any barriers to optimal treatment for lung cancer in South West Victoria.

Methods Treatment pathways on all patients newly diagnosed with lung cancer was collated (2015, n=200).

Results A total of 88% of the lung cancer patients had a history of smoking. Many of the patients presented at Stage III or IV at diagnosis (59%), 25% were diagnosed after an emergency department visit, 85% had chest x-rays, 92% had CT scans, and 86% saw their specialist within 2 weeks. Patients residing in Geelong were more likely to have their treatment plan discussed at a multidisciplinary meeting compared to patients in the South West (75% versus 42%). At 12 months post-diagnosis there was a higher survival rate for patients residing in Geelong compared to those living in the South West region (51% versus 31%) and for females (57% versus 36%).

Conclusion The majority of patients had a history of smoking and many presented with late-stage disease.

Introduction

Lung cancer is divided into non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC), with differences in tumour behaviour and therefore treatment. Tumour stage at diagnosis and how long a newly diagnosed person waits until first treatment can affect outcomes^{1,2}. In the Barwon South West region of Victoria there are many smaller regional/rural towns, with up to 100 km to travel to the nearest major health service (Figure 1). Concerns about distance to travel while unwell, time away from work, a reluctance for regular medical checkups, and fear of the unknown all have the potential to delay presentation.

We have previously reported that approximately 20% of those diagnosed with cancer in the emergency department (ED) have lung cancer, and 38% of persons newly diagnosed with lung cancer had visited the ED for many reasons, not necessarily resulting in cancer diagnosis, 6 months prior to diagnosis³. Patients presenting to the ED often have a worse outcome and a later stage at diagnosis. Ideally, presenting at an earlier stage will result in a better outcome.

The Barwon South West region consists of coastal resort areas with small townships, a large rural farming region and smaller farmlets. As at 2016 there were 418,103 people residing in the

32,767 km² region⁴ with 25% (n=104,908) aged older than 60 years. In 2016, there was a high percentage (29.2%) of the population whose household was in the lowest socioeconomic quartile. Therefore the Barwon South West region has a substantial section of the population that are of an older age or in a lower socioeconomic sector, both associated with increased risk of lung cancer^{5,6}. In 2015, it was reported that 22% of males and 12% of females in the Barwon South West were currently smoking⁷, 46% of the population having ever smoked.

Cancer Council Victoria have developed a set of optimal care pathways to promote and acknowledge a standard of care⁸. For example, the Barwon South Western Regional Integrated Cancer Services (BSWRICS) supports all health services in the region to improve quality, coordination and planning of cancer services. BSWRICS fulfils its role by consulting and collaborating with regional health partners and consumers and works toward providing equitable services for the rural and regional areas of South West Victoria. Prior studies have acknowledged the challenges of distance and remoteness in providing appropriate health services⁹. Supporting this service is a large database, the Evaluation of Cancer Outcomes Barwon South West (ECOBWSW) Registry, a listing of all residents newly diagnosed with cancer in the region and a recording of their treatment pathways¹⁰; any identified deviation from the standard of care is investigated. This study reports on any barriers to optimal treatment for lung cancer in our regional/rural area.

Methods

The ECOBSW Registry has electronically and manually collected data on all newly diagnosed lung cancer tumours in the Barwon South West Region from all major health service medical records¹⁰. Demographics, treatment pathways and outcome data

were recorded for all newly diagnosed patients in the region from 2009 to 2015. This data, linked to the recommendations of the optimal care pathways⁸, are reported in this study for the most recent complete year of 2015. For the purpose of comparing regional and rural regions, the Greater Geelong area was defined as towns within 30 km of central Geelong, with the remainder of the region labelled as South West. The term 'ever smoked' described persons who had smoked more than 100 cigarettes or cigars anytime during the course of their life.

Results

In 2015 there were 200 persons newly diagnosed with lung cancer in the Barwon South West region (Figure 2). A total of 85% were aged older than 60 years; the average age was 72.2 years (SD 10.7 years), with the youngest 41 years and the oldest 98 years. Of the 200, 56% were men; their average weight at diagnosis was 76.6 kg (SD 14.7 kg) and for women it was 65.7 kg (SD 17.0 kg). Just under one third (32%, n=63) had private health insurance.

Prevention is always better than cure; however, 176 (88%) had a history of ever smoking, with 69 (35%) currently smokers at diagnosis. Those younger than 60 years were more likely to be currently smoking (65% versus 28%, p<0.01). In addition, 22 had recorded in their medical record that they had prior asbestos exposure.

The initial recommended investigation is chest x-ray, with any suspected cancers immediately referred. It was recorded in the medical records that 85% had a chest x-ray. Contrast spiral computed tomography (CT) of the chest and upper abdomen is recommended if the chest x-ray is inconclusive. Our study found 92% had a supportive investigation of a CT scan. Tumours

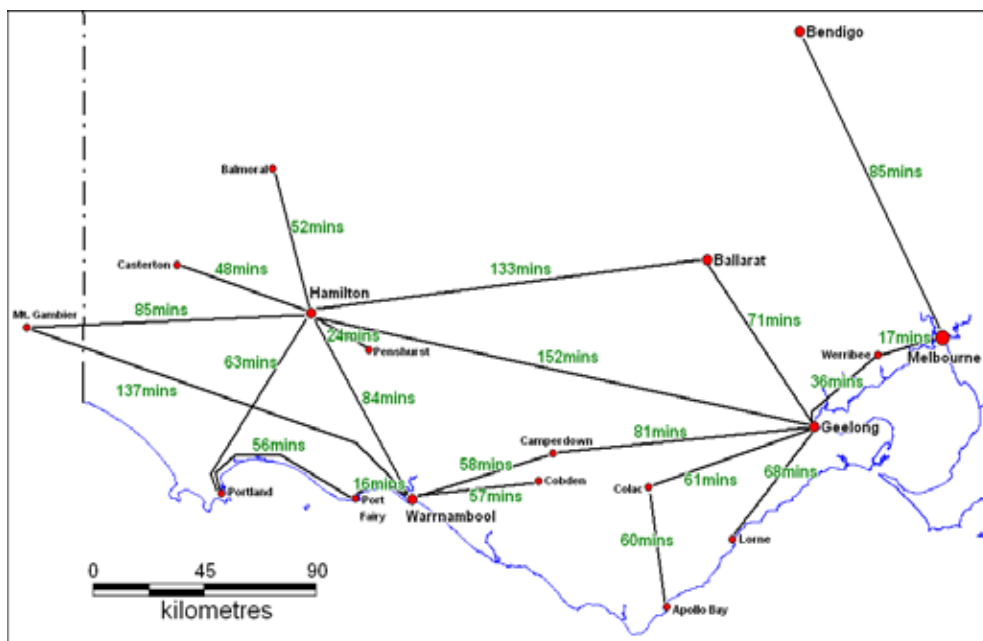


Figure 1. Relative travel times between health services in the Barwon South West region.

by primary site are displayed in Table 1, with the highest percentage in the upper lobe, bronchus or lung. The morphology showed that there were 132 NSCLC, 25 SCLC and 43 other. It is recommended that patients see a specialist within 2 weeks of referral. Dates allowing this calculation were recorded in the medical record for 83 patients, with 71 (86%) seen within this period. Referral pathways were also recorded – 50 (25%) were diagnosed after an ED attendance or an emergency admission.

The majority (n=138, 69%) of patients were diagnosed at a health service in the main regional city, Geelong. Endobronchial ultrasound (EBUS) was included for 14 consumers and positron emission tomography (PET) scans for 111. A total of 85 (43%) were diagnosed at Stage IV, 32 (16%) at Stage III, 14 (7%) at Stage II, 27 (14%) at Stage I and 42 (21%) were not recorded in the medical record.

Some 65% (n=129) of patients were discussed at a multidisciplinary meeting. A higher proportion of patients who were residents of Greater Geelong were presented to a multidisciplinary meeting than residents from the South West region (75% versus 42%, p<0.01). A higher proportion of Stage I–III were presented to a multidisciplinary meeting compared to Stage IV and stage not recorded in the medical record (88% versus 51%, p<0.01). There was no significant difference in proportions presented to the multidisciplinary meeting for public or private patients (p=0.49) or for those aged younger or older than 60 years (p=0.68).

Surgery occurred for 28 (14%) patients. Surgery benefits those with early stage NSCLC. Our study found 13 (54%) of 24 patients with Stage I NSCLC at diagnosis had surgery. Those that did not have surgery included a higher proportion of men (n=8, 73%, p<0.01). Radiotherapy was received by 93 (47%). Radiotherapy may be beneficial to those with advanced local NSCLC for

Table 1. Number of new diagnosis by primary site.

Primary site	Total (%)
Main bronchus (C34.0)	11 (6%)
Upper lobe, bronchus or lung (C34.1)	85 (43%)
Middle lobe, bronchus or lung (C34.2)	8 (4%)
Lower lobe, bronchus or lung (C34.3)	53 (27%)
Overlapping lesion of bronchus and lung (C34.8)	6 (3%)
Bronchus or lung unspecified (C34.9)	19 (10%)
Anterior mediastinum (C38.1)	1 (0.5%)
Mesothelioma of pleura (C45.0)	15 (8%)
Mesothelioma of peritoneum (C45.1)	1 (0.5%)
Mesothelioma of other sites (C45.7)	1 (0.5%)
TOTAL	200

whom surgery is not suitable. This study found 15 (79%) out of 19 within this criteria had radiotherapy. For all patients, radiotherapy may be beneficial for palliative intent. Of those referred to the palliative care unit (n=129), there were 72 (56%) who had radiotherapy. Chemotherapy was received by 74 (37%). Chemotherapy is often recommended for advanced disease and good performance status; 42 patients diagnosed with Stage IIIb or IV cancer had an ECOG of 0 or 1 and 28 (67%) had chemotherapy. NSCLC with localised inoperable disease may benefit from combined chemotherapy and radiotherapy; of the 19 that met this criteria, nine (47%) had chemoradiation.

A total of 129 (65%) were referred to the palliative care unit, and a total of 35 had an advanced care plan reported in the medical record. More than half (n=110, 55%) died 12 months post-diagnosis, with a higher proportion of South West residents having died (69% versus 49%, p<0.01) and more men (64% versus 43%, p<0.01). There was no significant difference in the proportion of those

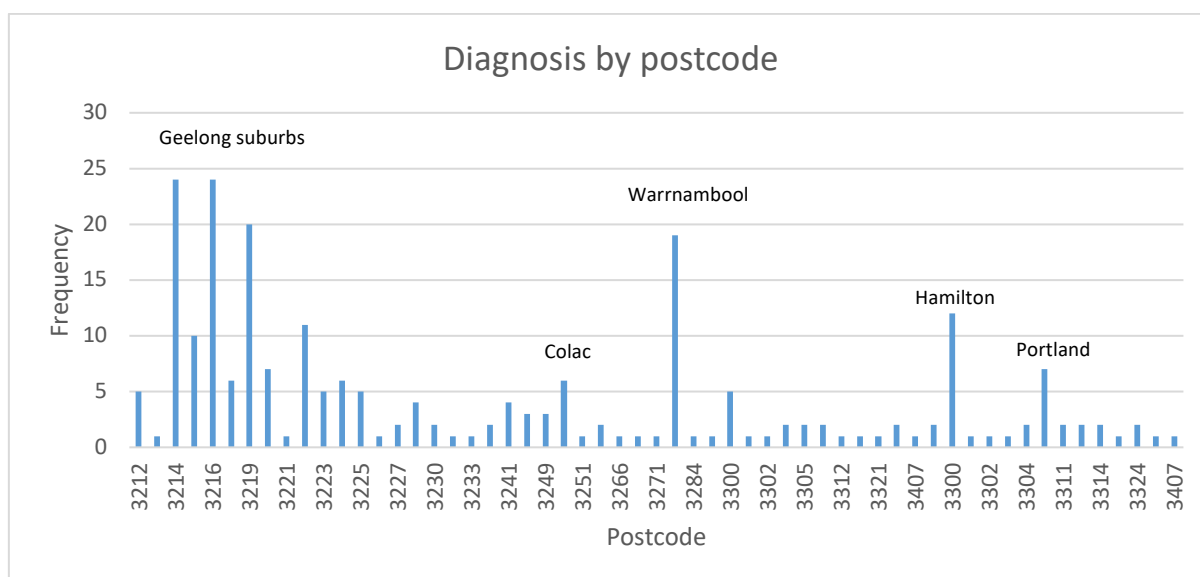


Figure 2. Location of persons diagnosed with lung cancer in the Barwon South West region.

who died and public or private patients ($p=0.67$), nor for those aged younger or older than 60 years ($p=0.23$).

Discussion

We found 88% of our lung cancer patients had a history of smoking. Within the Barwon South West general population, 46% had ever smoked. The Victorian Government banned smoking in enclosed public places in 2007, in cars carrying children in 2010, at train stations and tram stops in 2014, at school entrances in 2015, and all outdoor dining areas in 2017¹¹. We can do our best to optimise healthcare but is the damage already done before the patient arrives at the health service? Additionally, 43% of those diagnosed were Stage IV at diagnosis and this is a conservative estimate, with 21% of stages not recorded in the hospital medical record.

One-quarter were diagnosed after an ED visit; this figure is consistent or conservative compared to prior national and international studies^{12,13}. Symptoms of lung cancer are often respiratory symptoms, pain, neurological events or fever. Lung cancer patients present at a late stage and often from financially deprived populations. Potential financial constraints might be a reason for presenting to the ED where all costs are met.

Multidisciplinary meetings, whereby treatment plans are discussed and deliberated on by clinicians of many disciplines, commenced in the Barwon South West region in 2006 and have grown in size by increasing the number of tumour streams and health services administering the meetings over the years. In 2015, 16% of all cases discussed were lung cancer. However, the proportion of those presented who are residents from the South West in this study is not ideal, and further work to increase the number of these meetings in the more remote health services is required.

Unexpectedly, age was not related to those who had died within the first 12 months. More men and residents of the South West region had not survived. However, we do acknowledge the potential for a Type II error in our report, with small numbers involved in some of the comparisons.

If we are to move forward in reducing the number of lung cancer patients, then as a society we have the responsibility to say smoking is not okay. We can work as a health service to improve treatment in the rural/remote regions, but it is important to note that preventative health strategies must work simultaneously to address the damage done prior to people presenting for diagnosis and treatment. Even so, we can do better, by increasing the number of patients presented to multidisciplinary meetings, and this is high on our agenda.

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