The effect of age on the treatment of lung cancer patients in South East England

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Objectives

To investigate the effect of age at diagnosis on treatment received by lung cancer patients within 6 months of diagnosis in South East England. To assess other factors that might contribute to the likelihood of receiving treatment.

Introduction

Lung cancer incidence increases with increasing age [1,2]. Therefore as the population ages, it is becoming more important to reduce the existing inequalities between the treatment of elderly and younger cancer patients.

Although we are becoming more aware of the need for age equality in health care [3,4] and guidelines have been produced for the assessment and treatment of older cancer patients [5], there is evidence to suggest that there are differences between treatments received by patients according to their age [6].

This may sometimes be accounted for by co-morbidity factors, which can cause complications with particular treatment regimes [7].

Methods

Details of 57,807 cancer patients resident in South East England and diagnosed with lung cancer (ICD-10 C33-C34) between 1998 and 2007 were extracted from the Thames Cancer Registry database.

Four logistic regression analyses were carried out to identify which factors affected the odds of receiving chemotherapy, radiotherapy, cancer surgery and any form of treatment. The factors taken into account were age (in three groups 0-64, 65-74, 75+), year of diagnosis, sex, socio-economic deprivation (based on the income domain of the Indices of Deprivation 2007), disease stage, cancer network of residence, ethnicity and urbanisation. Death-certificate-only registrations were excluded from the analyses.

Figure 1: Trends in the treatment of lung cancer 1998-2007

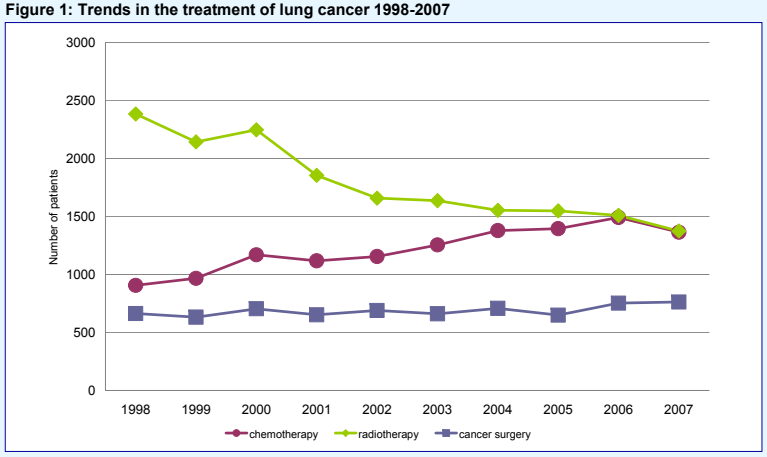
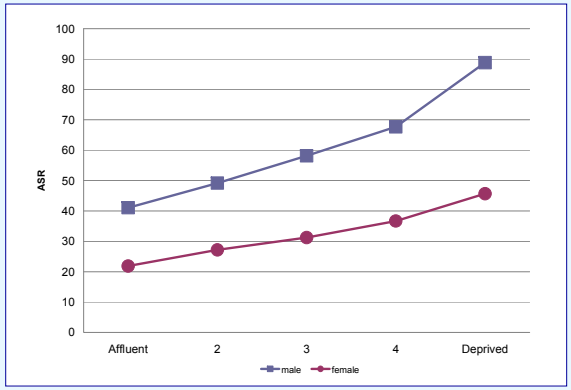


Table 1: Characteristics of lung cancer patients in South East England and percentage of patients with treatment recorded within 6 months from diagnosis

		Total registrations	Any treatment recorded	Cancer surgery recorded	Chemotherapy recorded	Radiotherapy recorded
			(%)	(%)	(%)	(%)
Total Patients (excl. DCO)		57,807	75	12	21	31
Age	75+	24,236	62	6	8	26
	65-74	18,436	82	14	24	33
	0-64	15,135	89	19	39	37
Year of diagnosis	1998	5,797	77	11	16	41
	1999	5,670	77	11	17	38
	2000	6,145	77	11	19	37
	2001	5,754	76	11	19	32
	2002	5,616	74	12	21	30
	2003	5,603	76	12	22	29
	2004	5,728	76	12	24	27
	2005	5,772	74	11	24	27
	2006	5,975	76	13	25	25
	2007	5,747	72	13	24	24
Sex	male	34,379	77	12	21	32
	female	23,428	73	12	21	29
Deprivation quintile	1-affluent	7,491	77	14	24	31
	2	9,215	75	12	21	32
	3	11,180	75	11	21	32
	4	14,191	74	12	20	31
	5-deprived	15,730	76	12	21	29
Stage	stage 1	17,123	79	14	19	31
	stage 2	2,616	90	13	29	46
	stage 3	1,436	97	71	33	27
	stage 4	20,789	78	11	24	35
	unknown	15,843	64	6	17	25

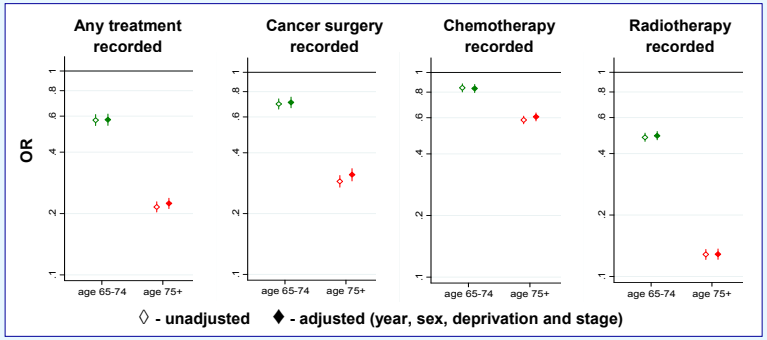
Figure 2: Age-standardised incidence rates of lung cancer by socio-economic deprivation quintile and sex



References

1. Quaglia A, Tavilla A, Shack L, Brenner H, Janssen-Heijnen M, Allemani, C, Colonna M, Grande E, Grosclaude P, Vercelli M (2009) The cancer survival gap between elderly and middle-aged patients in Europe is widening. *European Journal of Cancer* **45**: 1006-1016.
2. Govorov A, Pushkar D (2008) Cancer in the Elderly: What is Different? European Urology Supplements **7**: 447-455
3. Carruthers I, Ormondroyd J (2009) Achieving age equality in health and social care http://www.dh.gov.uk/
4. Oliver D (2009) Age based discrimination in health and social care services BMJ 339:b3378
5. National Comprehensive Cancer Network: Clinical Practice Guidelines in Oncology: Senior Adult Oncology V.I. 2010 http://www.nccn.org
6. Rocha Lima C, Herndon J, Kosty M, Clamon G, Green M (2002) Therapy choices among older patients with lung carcinoma *American Cancer Society* **94** : 181-187
7. Janssen-Heijnen M, Houterman S, Lemmens V, Louwman M, Maas H, Coebergh J (2005) Prognostic impact of increasing age and co-morbidity in cancer patients: A population-based approach *Critical Reviews in Oncology/Hematology* **55**: 231-240

Figure 3: Odds ratios (OR) and 95% confidence intervals for lung cancer patients with treatment recorded: unadjusted and adjusted for year of diagnosis, sex, socio-economic deprivation quintile and stage of disease (age group 0-64 as baseline)



Results

Table 1 shows the characteristics of the lung cancer patients in South East England and the percentages of patients with the four treatment types recorded. Between 1998 and 2007 there was an increase in patients receiving chemotherapy and a decrease in patients receiving radiotherapy (see figure 1). The age-standardised incidence rates by socio-economic deprivation quintile show a higher incidence in males than females and an increasing trend by quintile, with more deprived areas having higher incidence rates (see figure 2).

All four logistic regression analyses showed that lung cancer patients aged 75 and over were less likely to receive treatment than younger patients, with the largest difference between age groups being in patients receiving chemotherapy (age 65-74: adjusted OR=0.49, 95% CI [0.47, 0.51], age 75+: 0.13, [0.12,0.14]) and the smallest difference between age groups being in those receiving radiotherapy (age 65-74: 0.83, [0.80, 0.87], age 75+: 0.61, [0.58, 0.63]) (see figure 3).

The logistic regression results also revealed that females were more likely to receive cancer surgery than males, but less likely to receive other treatments. Socio-economic deprivation showed a decreasing trend with patients from more deprived areas least likely to receive treatment. Stage of disease was a highly significant factor affecting whether or not a patient receives each type of treatment. There was little variation between cancer networks, and ethnicity and urbanisation were not significant predictors of receiving treatment.

Conclusions

In South East England the likelihood of a lung cancer patient receiving treatment decreases with increasing age. Even after adjustments are made to account for differences in sex, socioeconomic deprivation and stage of disease between the age groups, there is still significantly less chance of an older patient receiving treatment, suggesting that treatment choice is directly related to age.