Decreased survival of patients with lung cancer admitted to a teaching hospital through the emergency department in Barcelona, Spain

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Few studies have analysed the characteristics and prognosis of patients with lung cancer that present to accident and emergency departments.¹ Improving the referral of cancer patients from primary care to hospitals is of wide interest in many Western countries.² Hospital tumour registries have a role in assessing clinical outcomes. The tumour registry of our hospital has noted that half of all initial admissions for cancer occur via the emergency department.³ Concern over inappropriate use of the hospital emergency department would be further justified if it was associated to a poorer outcome. We analysed clinical characteristics at presentation and survival by mode of admission among patients with lung cancer first admitted at our centre.

Methods

We used the basic clinical information available at the Tumour Registry of Hospital del Mar, a 450 bed teaching hospital primarily serving a low income area in Barcelona.^{4,5} Patients with lung cancer first admitted at the hospital between January 1990 and December 1993 were selected for inclusion. Survival was measured in months after diagnosis. The median follow up for patients alive at the date of last control was 14.8 months. The mode of admission (emergency versus elective) was the primary independent variable. The survival of the two groups was assessed within strata of the variables shown in table 1. Kaplan-Meier survival curves by mode of admission were plotted, and tested by the log rank test. Crude and covariate adjusted hazard ratios (and 95%

Table 1 Distribution of clinical variables and survival by mode of admission

	Number	Elective		Emergency		p Value‡
		(%) *	Survival†	(%) *	Survival†	
Total	381	86 (22.6)	11.3	295 (77.4)	5.8	0.001
Age						
Q1 (≤58)	97	24.4	11.5	25.8	7.0	0.115
Q2 (59-66)	94	27.9	6.9	23.7	9.3	0.490
Q3 (67-72)	96	24.4	15.3	25.4	5.5	0.037
Q4 (≥73)	94	23.3	9.7	25.1	3.9	0.069
Sex						
Male	351	94.2	11.0	91.5	5.7	0.004
Female	30	5.8	29.4	8.5	6.2	0.085
Stage						
Local	61	26.7	22.3	12.9	17.5	0.208
Regional	130	36.0	12.8	33.6	9.3	0.330
Disseminated	143	27.9	6.1	40.3	2.9	0.042
Missing	47	9.3	4.5	13.2	1.2	0.891
Diagnostic basis						
Histological	199	60.5	15.3	49.8	7.8	0.010
Cytological	170	37.2	6.5	46.8	3.9	0.132
Missing	12	2.3	0.8	3.4	9.2	0.247
Histology/cytology						
Adenocarcinoma	57	16.3	22.3	14.6	4.6	0.059
Squamous cell	229	67.4	11.5	58.0	5.0	0.002
Small cell	65	10.5	11.0	19.0	7.0	0.767
Missing	30	5.8	4.5	8.5	2.1	0.328
Oncological treatment						
Yes	206	60.5	15.3	52.2	9.3	0.116
No	163	36.0	6.4	47.7	2.3	0.002
Missing	12	3.5	0.4	3.1	18.5	0.196
Treatment intention						
Radical	72	30.2	22.3	15.6	13.4	0.475
Palliative	104	27.9	9.7	27.1	9.7	0.890
Symptomatic	171	36.0	6.4	47.5	3.2	0.009
Missing	34	5.8	11.5	9.8	2.5	0.369
Duration of symptoms						
0-30 days	60	5.8	9.2	18.6	6.2	0.882
31-90 days	124	20.9	9.7	35.9	5.6	0.186
≥91 days	111	36.0	7.2	27.1	6.0	0.068
Missing	86	37.2	15.3	18.3	4.4	0.012

*Per cent of patients in each stratum, that is, column per cent (except for the "total" row, in which the number of patients and the row per cent are shown); †median (in months);

‡survival difference between electively and emergency admitted patients in each stratum (log rank test).

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confidence intervals, CI) were computed by Cox's proportional hazards regression. The assumption of proportionality was checked and confirmed for each variable by means of plots and the statistical significance of the time interaction term.⁵

Results

Of the 381 patients included in the analysis, 295 (77%) had been admitted through the emergency department. Their median survival (5.8 months) was significantly lower than that of the 86 electively admitted patients (11 months) (table 1). The distribution of most prognostic factors was more favourable for elective patients (for example, stage, treatment). Upon stratification, the decreased survival of emergency patients was observed in 20 of the 22 covariate strata; differences were greater than 12 months or statistically significant at the 5% level in the 67–72 age group, men and women, patients with disseminated tumours, adenocarcinomas not otherwise specified and squamous cell carcinomas, patients whose diagnosis was histologically based, patients not having received oncological treatment, and patients treated with a symptomatic intention. The crude hazard ratio for emergency versus elective patients was 1.59 (CI: 1.18, 2.14, $p = 0.002$). When adjusted for age, sex, stage, and oncological treatment the corresponding hazard ratio was 1.53 (CI: 1.13, 2.08, $p = 0.006$). When adjusted for age, sex, stage, and treatment intention the excess risk for emergency patients was 1.47 (CI: 1.08, 1.99, $p = 0.013$). Allowance for the other variables that fulfilled the proportionality assumption did not change these results to any appreciable extent.

Discussion

The proportion of lung cancer patients first admitted via the emergency department at our hospital seems well in the upper range of the cancer literature. Whereas some of our subgroups were too small to yield statistically precise estimates, the excess risk observed among emergency patients was consistent enough across covariate strata to warrant further study. Ways to optimise cancer services at all levels of

the health system are continually being investigated.^{1 2 4 5} In Spain a hospital admission is always authorised by a hospital staff physician, and it can essentially take place either after the patient presenting to the emergency department (at his own initiative or at the advice of a primary care professional) or be elective (that is, from outpatient clinics to the hospital ward). As coordination among levels of care is often suboptimal, both patients and primary care physicians resort to the emergency department. The precise reasons for presentation to and admission through the emergency department would have to be ascertained by a specific study. Accurate information on presenting symptoms, severity of disease, and other clinical data are also needed to disentangle the mechanisms through which this phenomenon occurs. It can be argued that emergency departments constitute a useful resource for improving access to cancer diagnosis and treatment. This study challenges this view by showing that the condition of emergency patients when they arrive at the hospital is severe and hampers survival. Emergency departments seem unable to offset weaknesses in primary care and in the integration among the different levels of the health system.⁶

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Conflicts of interest: none.

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