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ORIGINAL ARTICLE

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Smoking and its relation to the histological type, survival, and prognosis among patients with primary lung cancer

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The frequency of smoking among patients with primary lung cancer diagnoses admitted to the Hospital de Clinicas de Porto Alegre (HCPA) during the 1980's was investigated. The objective of this study was to analyze cigarette consumption patterns through the number of cigarettes smoked per day and the age at which smoking began, correlating this data to the overall survival rate and histological type of the lung cancer. Methods: This retrospective study analyzed patients with primary lung cancer diagnosed at the HCPA between January 1980 and December 1989. All patients considered underwent follow-up for at least three years. Patient information was obtained either from the hospital's records or by contacting patients via letter or phone. Results: More than 90 percent of the patients were smokers or had smoked previously; most had started smoking before the age of 20. The overall 24-month survival rate after diagnosis varied depending on whether the patient had smoked less than 40 cigarettes per day or not. The percentage of smokers and non-smokers was established for each histological type, with the bronchoalveolar adenocarcinoma type showing the highest percentage of non-smokers (40 percent). Conclusion: The overall survival rates of patients with lung cancer was related to the number of cigarettes smoked, and not to the fact of the patient having smoked or not. The number of smokers among patients with lung cancer was not so high only for the bronchoalveolar adenocarcinoma histological type.

UNITERMS: Lung cancer, tobacco, prognosis, histology.

INTRODUCTION

During 1990, approximately 419,000 deaths (about 20 percent of all deaths) in the United States were attributed to smoking. Included in this number were 150,000 deaths from neoplasia.[1] Smoking is still the most prevalent cause of premature deaths in that country.[2] In Brazil, it is estimated that smoking is responsible for 125,000 deaths per year.[3] In Latin America, tobacco consumption is an important risk factor for the development of lung neoplasia.[4,5] Lung cancer is the principal cause of death from cancer in both sexes,[6] and smoking is responsible for approximately 87 percent of all lung cancer deaths.[2] This study's objectives were to investigate the incidence of smoking among patients with primary lung neoplasia, and its relation to survival based on the neoplasia histological type, as well as on the age at which smoking began and the number of cigarettes smoked per day.

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METHODS

The study was composed of patients with primary lung tumors and histological proof of the disease who had been treated by the Pneumology Department of the Hospital de Clinicas de Porto Alegre (HCPA) throughout the 1980's (January 1980 to December 1989). Patients'

identification data, number of cigarettes smoked per day, age at which they began smoking, and information on the histology of the neoplasia were systematically taken from hospital records. In the survival analysis, only those patients for whom it was possible retrospectively to obtain information on survival time after treatment - be it through reviewing the records or active communication with the patient - were studied.

Patients were always excluded if there was doubt as to the primary site of the lesion, and when the patient had only clinical criteria for lung cancer without the possibility of confirming the diagnosis.

Non-industrialized cigarettes and cigars were included as being equivalent to three normal cigarettes.

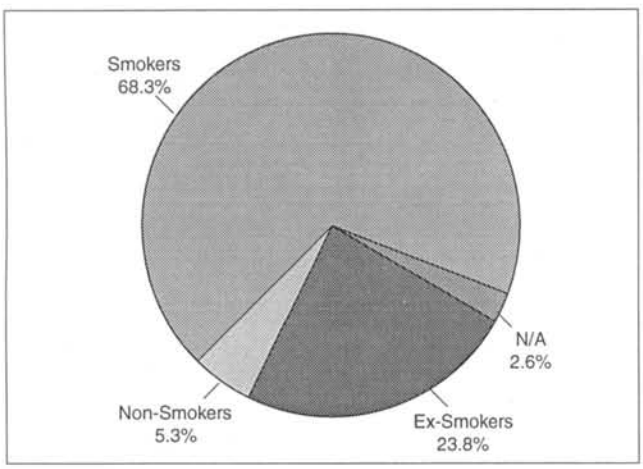

Figure 1 - *Smoking frequency amongst lung cancer patients.*

Patients who could not precisely give the quantity consumed, or the age at which use began, were excluded only from calculations in which the unknown variable was considered. The data was computed and analyzed using the computing program Epi Info, version 5.01b.

RESULTS

In a sample of 378 patients with primary lung neoplasia, there was information on cigarette consumption habits of 368 patients. The histological type could be determined for 367 patients, epidermoid being the most prevalent.

FREQUENCY OF SMOKING

Figure 1 depicts the percentage of smokers and non-smokers among the patients studied. In Table 3, sex is also differentiated; men comprise a significantly greater percentage of smokers and non-smokers ($p<0.001$).

In this sample of lung cancer patients, the percentage of smokers is greater than the percentage of non-smokers or ex-smokers, independent of sex. The average survival time after diagnosis (for those patients for whom survival

Table 2
Smoking x Histological Type

Smoking	Epi	Adeno	Adeno*	Large	Small	Mixed	Undet.	Total
Yes	118	68	6	11	48	6	0	257
No	2	11	6	0	1	0	0	20
Ex-Smoker	30	32	3	2	19	3	1	90
Total	150	111	15	13	68	9	1	367

Obs: One smoker had no confirmed histological type. Other patients lacked information on smoking.

Legend: Epi = epidermoid; Adeno = adenocarcinoma per say; Adeno* = adenocarcinoma bronchoalveaolar; Large = large cells; Small = small cells; Undet. = undertermined

Table 3
Number of cig/day by sex

Cig/day	Men	Wonen	Total	With Known Survival	Survival in Months
10-19	6 (8%)	3 (21%)	9 (10%)	8	11
20-29	34 (46%)	9 (64%)	43 (48%)	29	15
30-39	7 (9%)	1 (7%)	8 (9%)	7	14
40-49	15 (20%)	1 (7%)	16 (18%)	9	10
=> 50	12(16%)	0	12(13%)	10	4.3
Total	74	14	88	-	-

information was available) was 14 months for the smokers, 14 months for the non-smokers, and 12 months for the ex-smokers.

Table 2 represents the smoking habit distribution between the diverse histological groups of pulmonary neoplasia. Figure 2 depicts these percentages. The histological subgroup adeonocarcinoma was subdivided into adenocarcinoma per say, represented by "Adeno," and bronchoalveolar adenocarcinoma, represented by "Adeno*". Only in this second group was the percentage of non-smokers not expressive (40 percent or 6/15). The epidermoid has the fewest non-smoking patients compared to the bronchoalveolar adenocarcinoma as well as to the adenocarcinoma per say (p=.001).

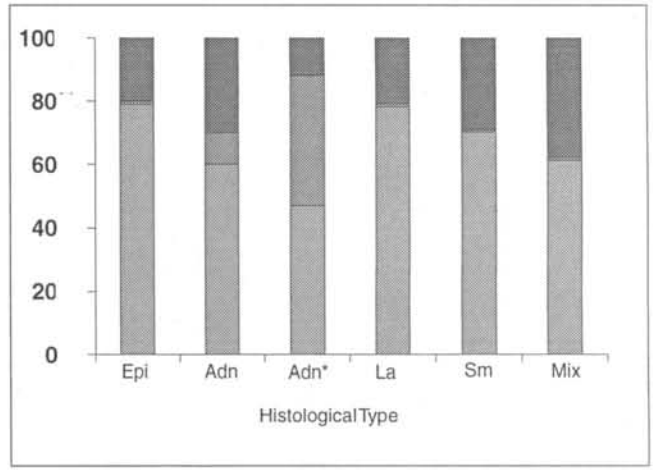

Figure 2 - Smoking x Histological Type

NUMBER OF CIGARETTES SMOKED PER DAY

The average number of cigarettes smoked per day in the total group was 26. Table 3 divides the number of cigarettes smoked per day (cig/day) into five categories. Forty-eight percent of the patients had a consumption pattern of 20-30 cig/day. Women less frequently smoked more that 40 cig/day than did men. In our patient sample, there were none who smoked less than 10 cig/day. The survival time for each category is given for those patients with available survival information.

The number of cigarettes consumed per day showed a correlation to the survival time after the lung cancer diagnosis. In Figure 3, patients for whom information on the amount of cigarettes smoked per day was available in the records were divided into those who smoked more than 40 cigarettes per day, and those who smoked less. Following the graph along the months after diagnosis, a

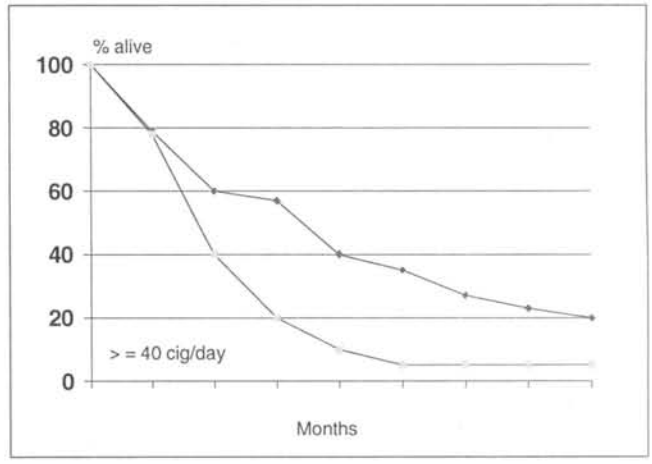

Figure 3 - Survival x Number of cig/day smoked

superior survival rate can be observed in the group who smoked fewer cigarettes per day.

Table 4 relates the histological type to the number of cigarettes smoked per day. The histological subtype bronchoalveolar adenocarcinoma (Adeno*) had the largest

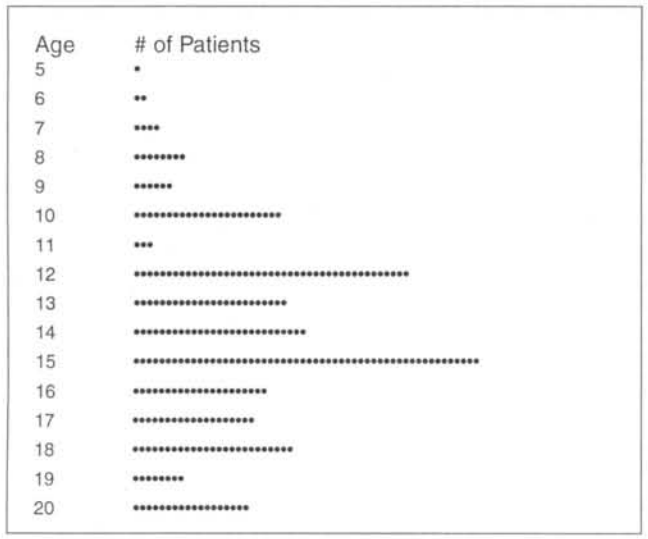

Figure 4 - Number of patients who began to smoke at each age

percentage of patients who had smoked between 20-29 cig/day. This same amount is similar for the patients with neoplasia classified as adenocarcinoma per say, and those with the epidermoid histology.

AGE AT WHICH SMOKING STARTED

A majority of the patients began to smoke between the ages of 10-20. Percentage-wise, there were more women who began to smoke before the age of 10 than men, and again in the category of those who began after 30, there are more women than men. Survival is not related to the age at which the patient began to smoke, at least for those patients for whom it was possible to determine survival (Table 5).

Table 5 illustrates the number of patients who began to smoke at each age; characteristically, the greater number began in adolescence. Eighty percent began to smoke before the age of 20. The age at which it was most common to start smoking was 15.

Table 4
Number of cig/day x Histological Type

Cig/day	Epi	Adeno	Adeno*	Large	Small	Mixed	Total
10-19	4 (11%)	2 (7%)	1 (20%)	0	2 (10%)	0	9 (10%)
20-29	18 (52%)	14 (51%)	2 (40%)	0	9 (45%)	0	43 (48%)
30-39	2 (6%)	4 (14%)	0	0	2 (10%)	0	8 (9%)
40-49	3 (9%)	6 (22%)	0	1	5 (25%)	1	16 (18%)
+> 50	7 (20%)	1 (4%)	2 (40%)	0	2 (10%)	0	12 (13%)
Total	34	27	5	1	20	1	88

Legend: Epi = epidermoid; Adeno = adenocarcinoma per say; Adeno* = adenocarcinoma bronchoalveaolar; Large = large cells; Small = small cells.

Table 5
Age smoking started by sex

Age smoking started	Men	Women	Total	With known survival	Survival in months
before 10	17(6%)	4 (10%)	21 (7%)	11(52%)	21
10-19	203 (76%)	19	222 (73%)	149 (67%)	14
		50%			
20-29	38 (14%)	8 (20%)	46 (15%)	24 (75%)	18
over 30	7 (2%)	7 (18%)	14 (4%)	8 (57%)	16
Total	265	38	303		

DISCUSSION

Among the patients diagnosed with primary pulmonary neoplasia in the decade of the 1980's at HCPA, a smoking habit was encountered in more than 50 percent. At the time of diagnosis, 68 percent were currently smoking, and 23 percent were ex-smokers.

This habit was only not associated in a greater manner when the histological type was bronchoaveolar. A smoking habit was not differentially related to the average survival time for lung cancer.

Nevertheless, survival for patients who smoked over 40 cig/day was worse than for those who smoked fewer. On average, patients that smoked more than 50 cig/day survived only half the time after a neoplasia diagnosis as patients who smoked less than this. This study could not distinguish a relationship between the number of cigarettes smoked per day and any of the histological neoplasia types.

Half of the patients started smoking between ages 10-15, with 15 being the most common age to begin. There was also no relation between the age consumption began and lung cancer survival time.

Thus, in the sample studied, outside of the histological type bronchoalveolar adenocarcinoma, a smoking habit was related to pulmonary neoplasia. The adenocarcinoma and epidermoid types were differentiated as to the percentage of non-smokers. The number of cigarettes smoked per day was not related to the histological type, put could prognosticate a poorer survival time after a neoplasia diagnosis for those smokers over 40 cig/day. The age at which smoking began was between 10-15 years-old for half of the patients, but was not related to the survival time for lung cancer.

RESUMO

Objetivo: A incidência do hábito do tabagismo entre pacientes com neoplasia primária de pulmão, diagnosticada no HCPA na década de 80, foi investigada. Outro objetivo do trabalho foi analisar o padrão de consumo de cigarros, através da quantidade de cigarros consumidos por dia, a idade do início do consumo, correlacionando-o com a sobrevida do paciente e o tipo histológico da neoplasia. **Material e Métodos**: pacientes com neoplasia primária de pulmão, diagnosticada no HCPA entre janeiro de 1980 e dezembro de 1989, tiveram acompanhamento por no mínimo três anos. O estudo foi retrospectivo, tendo sido feito através de registros hospitalares e comunicação com os pacientes por carta e telefone. **Resultados:** Um percentual de 91% dos pacientes era fumante ou ex-fumante. A maior parte dos pacientes começou a fumar antes dos 20 anos. A sobrevida até 24 meses após o diagnóstico era diferente, conforme o paciente fumasse menos de 40 cigarros por dia ou não. O percentual de fumantes é determinado para os diferentes tipos histológicos, sendo o tipo adenocarcinoma bronquíolo alveolar o que maior índice de não-fumantes apresentava.**Conclusão:** a sobrevida dos pacientes esteve associada com o número de cigarros fumados, mas não com o fato do paciente ter fumado ou não. A elevada incidência de fumantes entre os pacientes com neoplasia pulmonar (91%) só não foi tão expressiva para pacientes com o tipo adenocarcinoma bronquíolo alveolar.

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