

Prognosis and survival of lung cancer in the elderly

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Abstract

Introduction: In our department, from 2012 to 2020, 33.3% of patients treated for lung cancer were over 70 years old. Our study aimed to estimate overall survival and investigate the significance of prognostic factors in a population of 308 patients aged over 70 with lung cancer, collected from January 2012 to June 2020.

Methods: The initial assessment included at least a bronchoscopic examination and thoracic computed tomography. Survival rates were calculated using the Kaplan-Meier method and presented with 95% confidence intervals. The Log-Rank test was utilized for the comparison of survival curves.

Results: The 308 cases (9.6% females, 90.4% males) included 92.2% NSCLC (49.6% squamous cell, 45.4% adenocarcinomas) and 7.8% SCLC. The median age at diagnosis was 74 years, 14.6% were non-smokers, and 55.8% were former smokers. 67.9% of patients had at least one comorbidity, 1.6% had a PS equal to 0, and 28.2% had a PS ≥ 2 . TNM staging found 9.2% of cases at stages I and II; 31.2% at stage III, and 59.7% at stage IV. The median overall survival was 8.312 months [6.947-9.678], and the 1-year survival rate was 35.1%. Better survival was correlated with female gender, absence of smoking, PS ≤ 1 , and TNM staging.

Conclusion: All standard therapeutic options for bronchial cancer can be considered in the elderly, but physiological aging and the prevalence of comorbidities alter the risk-benefit ratio of treatments. This emphasizes the need for the implementation of a comprehensive management strategy for this segment of society.

Keywords: Elderly; Lung Cancer; Prognostic; Prognostic Factors; Survival.

1. Introduction

Lung cancer is the most common cancer worldwide. In Algeria, it is the leading cancer in men in terms of incidence and mortality [1-3]. Lung cancer has also undergone significant changes across age groups over the past 40 years. Increased life expectancy, coupled with the evolution of lung cancer epidemiology, has led to a substantial rise in this cancer among the elderly. The lifetime probability of being diagnosed with lung cancer gradually increases with age [4], [5]. Standard therapeutic options for lung cancer can all be discussed in the elderly [6], but physiological aging and the prevalence of comorbidities alter the risk-benefit ratio of treatments. In our department, the proportion of individuals over 70 years old is steadily increasing in the population of patients treated for lung cancer: from 2012 to 2020, 33.3% of patients treated for lung cancer were over 70 years old.

2. Study objective

The main objective of this study was to analyze the vital status of a cohort of patients aged over 70 with lung cancer and define the impact of various clinical and histological factors on survival.

3. Patients and methods

- Prospective, cross-sectional, descriptive study of a cohort of 308 patients diagnosed with lung cancer recruited from the Multidisciplinary Consultation Meeting from 2012 to 2020.
- Inclusion criteria: Men and women with histologically proven lung cancer.
- Exclusion criteria: Secondary cancer with proven primary.
- Evaluation criteria:
- Survival: Kaplan-Meier method
- Tumor response: RECIST criteria (version 1.1)
- Toxicity: WHO and EORTC criteria.
- Statistical analysis: IBM SPSS Statistics 20 software, Univariate analysis: Chi-square or Fisher's test, significance if $p \leq 0.05$.
- Histological diagnosis (WHO 2004 and ERS/ATS/IASLC 2011): Morphology, histology, immunohistochemistry.

4. Results

4.3. Patients' characteristics

Table 1: Patients' Characteristics

Characteristics		N (%)
Age	Median	74 years
Gender	Men / Women	279 (90,6%) / 29 (9,4%)
Smoking	Non-smokers / Smokers / Former smokers	14,6% / 29,5% / 55,8%
Comorbidities	Hypertension	67,9%
	COPD	34,4%
	Diabetes	33%
	Heart disease	15,3%
TNM stage	I-II / III / IV	9,2% / 31,2% / 59,7%
	Adenocarcinoma	41,9%
Histology	Squamous cell carcinoma	45,8%
	Small Cell Lung Cancer	7,8%
PS	PS = 0 / PS = 1 / PS ≥ 2	1,6% / 70,1% / 28,2%

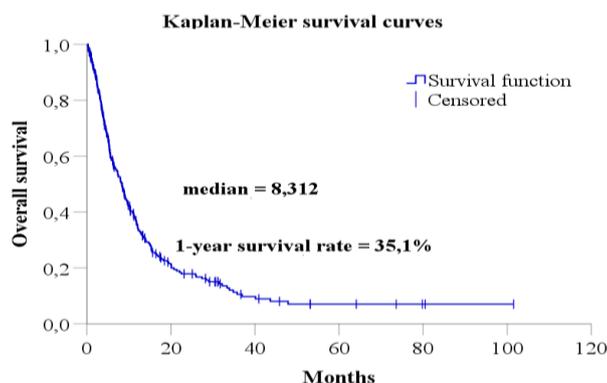
4.2. Analysis of prognostic factors

Table 2: Analysis of Prognostic Factors

Factors		Median survival (months)	P
Clinical			
Gender	Women / Man	12,287 / 7,951	0,033
PS	PS ≤ 1 / PS ≥ 2	9,659 / 4,665	0,000
Smoking	Smokers / Nonsmokers	5,881 / 11,828	0,039
Tumor			
Histology	AC / SCC	9,955 / 8,016	0,196
TNM stage	I-II / III / IV	25,856 / 7,951 / 7,951	0,000

Abbreviations (AC): Adenocarcinoma ; (SCC): Squamous-cell carcinoma;

4.3. Overall survival



In the follow-up of our patients, we have not observed any loss to follow-up. As of the evaluation cutoff date, 223 patients had died, and the overall median survival was 8.312 months with a one-year survival rate of 35.1%.

5. Discussion

- The improvement in survival induced by chemotherapy is comparable in elderly subjects and younger individuals. Our results highlight this reality with a median overall survival of 8.312 months and a one-year survival rate of 35.1%.
- In our series, patient gender, traditionally described as having an impact on prognosis, appeared as a discriminating factor in our univariate analyses. Women had a better survival rate than men. However, the proportion of women in our sample (29 women) was low compared to some studies where the influence of gender has been well-established. In those study populations, the proportions of women were significant (e.g., FLEX with 335 women and the Japanese study by T. Kawaguchi with 1432 women). [7, 8]
- Being an active smoker at the time of diagnosis is an unfavorable prognostic factor in lung cancer. Similar to certain studies [7, 9], the impact of smoking has been established in our series. As described in the literature, the influence of comorbidities appears to be non-significant on survival [10].
- Performance Status (PS) and TNM stage are prognostic factors consistently found in all studies on prognosis. A PS ≥ 2 and an advanced stage are correlated with short survival [11]; our results confirm these findings for both factors.
- The prognostic value of histological type is debated in various articles. For some [11], early-stage squamous cell carcinoma would have a better prognosis than an equivalent-stage adenocarcinoma, while for others [7], squamous cell histology is correlated with a poor prognosis. In our study, histological type did not influence the prognosis.

6. Conclusion

In light of the observations, which should be further enriched by additional studies, the main unfavorable prognostic factors identified in our patients, in univariate analysis, are male gender, smoking, a PS \geq 2, and an advanced TNM stage

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References

- [1] J. Ferlay, M. Colombet, I. Soerjomataram et al., "Estimating the global cancer incidence and mortality in 2018: GLOBOCAN sources and methods," *Int J Cancer*, vol. 144, no. 8, pp. 1941-1953, Apr 15, 2019. <https://doi.org/10.1002/ijc.31937>.
- [2] D. Hammouda, M. YAHIAOUI, L. BOUTEKDJIRET et al., "REGISTRE DES TUMEURS D'ALGER- Année 2017," https://www.insp.dz/images/PDF/Les%20registres/TumeursAlger/Registre_tumeurs_Alger_2017.pdf, Institut National de Santé Publique, Edition 2019, p. 33.
- [3] M. Hamdi Cherif, Z. Zaidi, D. Abdellouche et al., "Registre du cancer de Sétif (Algérie): incidence, tendance et survie, 1986-2005," *Journal Africain du Cancer / African Journal of Cancer*, vol. 2, no. 4, pp. 245-258, 2010/11/01, 2010. <https://doi.org/10.1007/s12558-010-0075-3>.
- [4] R. L. Siegel, K. D. Miller, and A. Jemal, "Cancer statistics, 2019," *CA Cancer J Clin*, vol. 69, no. 1, pp. 7-34, Jan 2019. <https://doi.org/10.3322/caac.21551>.
- [5] J. Ferlay, M. Colombet, I. Soerjomataram et al., "Cancer incidence and mortality patterns in Europe: Estimates for 40 countries and 25 major cancers in 2018," *Eur J Cancer*, vol. 103, pp. 356-387, Nov 2018. <https://doi.org/10.1016/j.ejca.2018.07.005>.
- [6] E. Quoix, G. Zalcman, J. P. Oster et al., "Carboplatin and weekly paclitaxel doublet chemotherapy compared with monotherapy in elderly patients with advanced non-small-cell lung cancer: IFCT-0501 randomised, phase 3 trial," *Lancet*, vol. 378, no. 9796, pp. 1079-88, Sep 17, 2011. [https://doi.org/10.1016/S0140-6736\(11\)60780-0](https://doi.org/10.1016/S0140-6736(11)60780-0).
- [7] R. Pirker, J. R. Pereira, A. Szczesna et al., "Prognostic factors in patients with advanced non-small cell lung cancer: data from the phase III FLEX study," *Lung Cancer*, vol. 77, no. 2, pp. 376-82, Aug 2012. <https://doi.org/10.1016/j.lungcan.2012.03.010>.
- [8] T. Kawaguchi, M. Takada, A. Kubo et al., "Gender, histology, and time of diagnosis are important factors for prognosis: analysis of 1499 never-smokers with advanced non-small cell lung cancer in Japan," *J Thorac Oncol*, vol. 5, no. 7, pp. 1011-7, Jul 2010. <https://doi.org/10.1097/JTO.0b013e3181dc213e>.
- [9] Y. Kogure, M. Ando, H. Saka et al., "Histology and smoking status predict survival of patients with advanced non-small-cell lung cancer. Results of West Japan Oncology Group (WJOG) Study 3906L," *J Thorac Oncol*, vol. 8, no. 6, pp. 753-8, Jun 2013. <https://doi.org/10.1097/JTO.0b013e31828b51f5>.
- [10] W. L. Read, R. M. Tierney, N. C. Page et al., "Differential prognostic impact of comorbidity," *J Clin Oncol*, vol. 22, no. 15, pp. 3099-103, Aug 1, 2004. <https://doi.org/10.1200/JCO.2004.08.040>.
- [11] J. P. Sculier, K. Chansky, J. J. Crowley et al., "The impact of additional prognostic factors on survival and their relationship with the anatomical extent of disease expressed by the 6th Edition of the TNM Classification of Malignant Tumors and the proposals for the 7th Edition," *J Thorac Oncol*, vol. 3, no. 5, pp. 457-66, May 2008. <https://doi.org/10.1097/JTO.0b013e31816de2b8>.