

# Lung Cancer in Women

Anas Arrad, Hafsa Sajjai, Meryem Rachidi, Hind Serhane, Salma Ait Batahar and Lamyae Amro

*Pneumology Department of University Hospital Center Mohammed VI, Marrakesh 40000, Morocco*

**Abstract:** At the same smoking level, women have a higher risk of lung cancer. The aim of the study was to evaluate epidemiological, clinical and histological profile of women's lung cancer. A retrospective study including women patients with a confirmed lung cancer followed at the Pneumology Department of University Hospital Center Mohammed VI of Marrakesh in Morocco between January 2010 and December 2014. 14 cases were included in the study. The average age of patients was 54.2 years. Active smoking was noted in 2 patients (14.4%). The chest X-ray showed an atelectasis in 6 cases (42.8%), hilar opacity in 6 cases (42.8%) and alveolar opacity in 2 cases (14.4%), pleural effusion was present in 3 cases (21.4%). Histological confirmation was obtained in 10 cases (71.4%) by bronchial biopsy, 2 cases with pleural biopsy (14.4%), one case (7.1%) by lymph node biopsy and one case trans-parietal biopsy (7.1%). An adenocarcinoma was found in 9 cases (64.3%), squamous cell carcinoma in 4 cases (28.6%) and small cell carcinoma in one case (7.14%). The study shows that the lung cancer in women in our context occurs more often in non-smoker patients and it's usually an adenocarcinoma type.

**Key words:** Lung cancer, women, adenocarcinoma, non smoker.

## 1. Introduction

At the same smoking level, women have a higher risk of lung cancer than men. Besides smoking, other factors appear to be related to lung cancer in women because 30% of women with lung cancer are non-smoking [1]. During the last 100 years, lung cancer was considered a predominantly male disease. Currently, although lung cancer remains common in men than women, the difference between the two genders tends to be shorter [2]. The aim of the study was to evaluate epidemiological, clinical and histological profile of women's lung cancer.

## 2. Materials and Methods

Retrospective study including patients with a confirmed lung cancer followed at the Pneumology Department of University Hospital Center Mohammed VI, of Marrakesh in Morocco between January 2010 and December 2014. Collecting data was performed using a questionnaire filled in by the investigator including the following items: general characteristics,

clinical, radiological, histological and stage of the disease. The statistical analysis uses the methods of descriptive analysis which consisted in the calculation of averages and standard deviations and percentages for the various quantitative and qualitative variables.

## 3. Results

### 3.1 Clinical Features

14 cases have been collected in the study. The average age of our patients was 54.2 years, ranging from 38 to 72 years. A low socioeconomic level was noted in 13 cases (92.8%). Data on occupation and occupational exposures are reported in Table 1.

Active smoking was noted in 2 patients (14.4%). Passive smoking has been reported in 6 cases (42.8%). First symptoms revealing the disease are reported in Table 2.

Data on the performance status of the patients are reported in Table 3.

### 3.2 Radiological Aspects

On standard chest X-ray, radiological aspects are reported in Table 4.

---

**Corresponding author:** Anas Arrad, doctor, research field: pneumology.

**Table 1 Occupations and occupational exposures.**

Occupations	occupational exposures	Number of cases	%
Cook	cooking fumes	1	7.2
Housewife	Combustion of wood	8	57.1
	None	5	35.7

**Table 2 Symptoms revealing the disease.**

Symptoms	Number of cases	%
Cough	10	71.4
Chest pain	3	21.4
Hemoptysis	1	7.2

**Table 3 Performans status.**

Performans status	Number of cases	%
0-2	5	35.7
3-4	9	64.3

**Table 4 Radiological aspects.**

Radiological aspect	Case number	%
Proximal opacity	6	42.8
Atelectasis	6	42.8
Peripheral opacity	2	14.4
pleurisy	3	21.4

### 3.3 Evaluation of the Disease

#### 3.3.1 Evaluation of Tumor Status “T”

All patients had a chest CT. 8 cases were classified as T3 (51.2%). 6 cases were classified T4 (42.8%). None of our patients was classified T1 or T2.

#### 3.3.2 Evaluation of Lymph Node Status “N”

10 cases were evaluated as N2, N3 were 4 cases.

#### 3.3.3 Evaluation of Distance Extension “M”

All patients had a brain CT scan and abdominal ultrasonography. None of our patients had PET scan, it is unavailable. 9 patients had least one metastatic site which are reported in Table 5.

#### 3.3.4 Stage of the Disease

The distribution of patients depending on the stage of the disease is reported in Figure 1.

### 3.4 Histology

#### 3.4.1 Diagnosis Confirmation

Histological confirmation was obtained in 10 cases (71.4%) by bronchial biopsy, 2 cases with pleural

biopsy (14.4%), 1 case by lymph node biopsy (7.1%) and a case transparietal biopsy (7.1%).

#### 3.4.2 Histological Types

The histological types found are reported in Figure 2. Clinical features are summarized in Table 6.

### 3.5 Treatment

None of our patients received surgical treatment. The treatment proposed for these patients according to the stage of disease and performance status are reported in Table 7.

### 3.6 Evolution

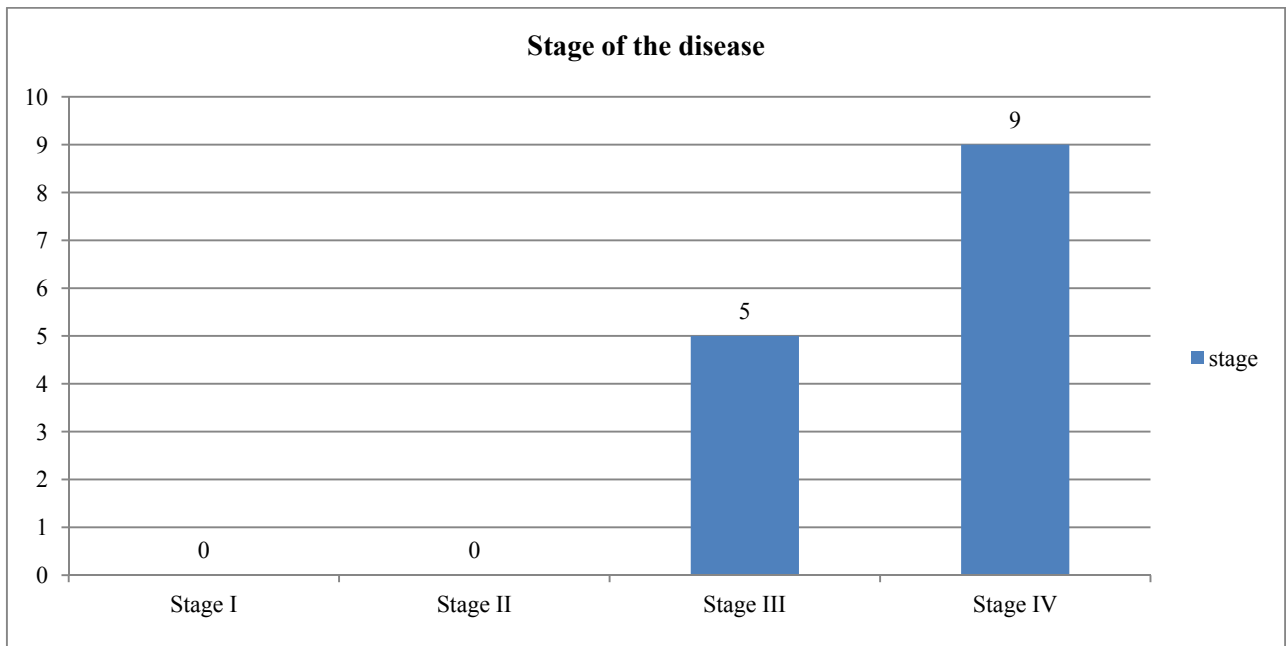
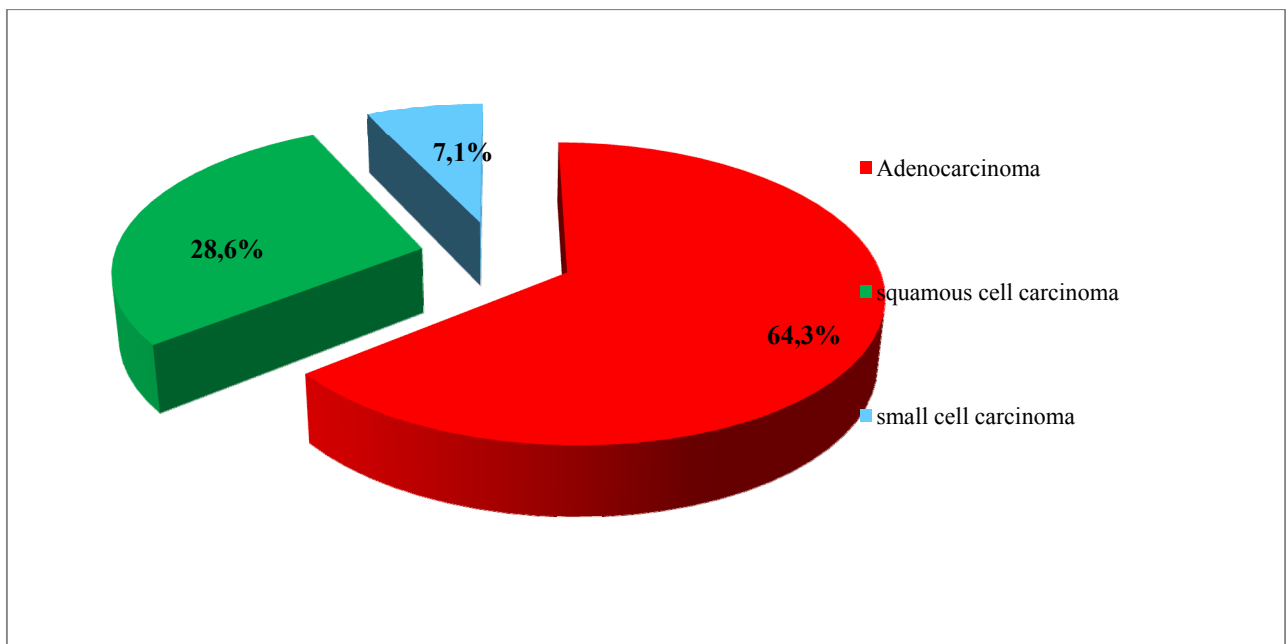
Mortality at one year was 92.8%. The causes of death were dominated by thromboembolic diseases.

## 4. Discussion

During the last 100 years, lung cancer was considered a predominantly male disease. Currently, although lung cancer remains common in men than women, the difference between the two genders tends to be shorter [2].

**Table 5 Metastatic sites.**

Metastatic sites	Number of cases	%
Contralateralpulmonary nodule	3	21.4
Liver	2	14.4
Adrenal	3	21.4
Brain	1	7.2
Distant metastaticnode	1	7.2
Metastatic Pleural effusion	2	14.4

**Fig. 1 Stage of the disease.****Fig. 2 Histological types.**

**Table 6 Clinical features.**

Variables		Nombre de cas	%
Age (years)	< 50	3	21.4
	> 50	11	78.6
Smoking status	Active	2	14.4
	Passive	6	42.8
	None smoker	6	42.8
Occupational exposures	Cooking fumes	1	7.2
	Combustion of wood	8	57.1
	None	5	35.7
Performansstatus	0-2	5	35.7
	3-4	9	64.3
	I-II	0	0
Stage	III	5	35.7
	IV	9	64.3
	Adénocarcinoma	9	64.3
Histology	Squamouscellcarcinoma	4	28.5
	Small cellcarcinoma	1	7.2

**Table 7 Treatment.**

Stage	Performansstatus	Number of cases	%	Treatment			
				Radiotherapy	Chemotherapy	Surgery	Symtomatictreatment
III	≤ 2	4	28.6	+	+	-	-
	> 2	1	7.1	+	-	-	-
IV	≤ 2	1	7.1	-	+	-	-
	> 2	8	57.2	-	-	-	+

In the United States, lung cancer mortality has surpassed the breast cancer one since 1987 (even if the breast cancer still is of course the most common women's cancer). In Europe, the sex ratio varies greatly across countries reflect differences in smoking habits. The lowest sex ratio is in Denmark at 1.7, while it is the highest in Spain at 13.4. In France, lung cancer was the sixth leading cause of cancer death in women in 1985 and rose to 3rd place in 1995 [3]. In 2015, Malvezzi et al. says that the mortality of lung cancer among European women might exceed the breast cancer one [4].

The average age of developing lung cancer in women is lower than men. In our series, the average age is 54.2 years. According Radzikowska et al., in a series of 2,875 women with lung cancer, young women develop more lung cancer than men, this difference is greater for adenocarcinoma type of cancer [5].

In some studies, age at diagnosis is higher in

women than in men [6], while in others, it is the opposite [5]. These discrepancies may be related to the proportion of non-smokers in these series. Non-smokers have a higher age at diagnosis than smokers [7].

The proportion of lung cancer due to smoking is lower by half in women compared to men. In 2000, it is estimated that over the world 85% of lung cancers in men are related to tobacco against only 47% in women [8]. This suggests a feminine susceptibility to lung cancer [2, 9]. Currently, the involvement of hormonal factor in the genesis of lung cancer is no longer any doubt; the estradiol plays a role of promoter for the growth of both lung fibroblasts and lung cancer cells [9]. Hormonal replacement therapy is associated with an increased incidence and mortality of lung cancer in women [9].

The incidence of lung cancer in women is growing exponentially this seems correlated with the increase

in smoking among women [1, 10]. Besides smoking, other factors appear to be related to lung cancer in women, with 30% of women with lung cancer are non-smoking [11]. In the study of Foegle, about 1,738 cases of lung cancer diagnosed in Bas-Rhine, it was noted 1.4% of non-smoking male cancer against 28.9% in women [12]. In Morocco, lung cancer incidence among men is 24.8/100,000 while in women the incidence is 3.4/100,000, this is correlated with the prevalence of smoking in Morocco which is 31.5% of men and 3.3% of women [13]. In our series, 85.7% of patients were non-smokers; this could be explained by a lower prevalence of smoking among women in Morocco. Tobacco is the main risk factor in women found in most series [1, 10, 11], in our series passive smoking was noted in 42.8%. According Boffetta, passive smoking is implicated in women in 14.2% of cancer cases [6].

Smoking is related to an increase of incidence of all histological types with a dose-effect relationship [5]. Adenocarcinoma is the most common histological type in women regardless smoking status. The second frequency is lung small cell carcinoma. Although adenocarcinoma is increasing in men in France (with a delay of several years compared to North America), squamous lung cancer remains the most common histological type in men in Europe [14]. In our series adenocarcinoma was found in 64.3%.

Besides smoking, other risk factors are implicated. In our series 64.2% of women are exposed at least to one carcinogenic domestic pollutant.

Most studies have shown a greater susceptibility of women to lung cancer [3]. The female gender seems to be a poor prognosis factor in lung cancer [3]. In our series, all patients had an advanced stage of disease at diagnosis (stage III or IV) with 64.2% stage IV cancer. Besides genetic susceptibility of women, in our context, other factors may delay the diagnosis explained in this population by a low socioeconomic level, health care access problems and the hesitancy of women to report smoking for cultural reasons.

In 2008, 5-year survival in France in women lung cancer patients was 17% for all stages in contrast to men which was 13% [15]. Survival is strongly correlated with the stages of the disease, the survival passes from 15% for stage III to 1% for stage IV [16]. In our series, survival is particularly low (7.4%) due to the diagnosis of the disease at late stages.

## 5. Conclusions

The study shows that the lung cancer in women, in our context, occurs more often in non-smoker patients, usually an adenocarcinoma type and discovered at late stages.

## References

- [1] Bunel, V., and Mazières, J. 2014. "Le Cancer Bronchique féminin." *Rev. Mal. Resp.* 6: 92-5.
- [2] William, J. B., and Joseph, K. 2004. "McLaughlin Are Women More Susceptible to Lung Cancer?" *Journal of the National Cancer Institute* 96 (2): 812-3.
- [3] Quoix, E. 2007. "Les nouveautés épidémiologiques du cancer bronchique: les non-fumeurs, les femmes, les fumeurs de cannabis." *Rev. Mal. Respir.* 24: 6S10-5.
- [4] Malvezzi, P. M., Bertuccio, T. R., Rota, M., Levi, F., La Vecchia, C., and Negri, E. 2015. "European Cancer Mortality Predictions for the Year 2015: Does Lung Cancer Have the Highest Death Rate in EU Women?" *Annals of Oncology* 26: 779-86.
- [5] Radzikowska, E., Gbáz, P., and Roszkowski, K. 2002. "Lung Cancer in Women: Age, Smoking, Histology, Performance Status, Stage, Initial Treatment and Survival. Population-based Study of 20,561 Cases." *Annals of Oncology* 13: 1087-93.
- [6] Sisti, J., and Boffetta, P. 2012. "What Proportion of Lung Cancer in Never Smokers can be Attributed to Known Risk Factors?" *J. Int. Cancer* 131: 265-75.
- [7] Nordquist, L. T., Simon, G. R., Cantor, A., Alberts, W. M., and Bepler G. 2004. "Improved Survival in Never-smokers vs Current Smokers with Primary Adenocarcinoma of the Lung." *Chest* 126: 347-51.
- [8] Parkin, D. M., Bray, F., Ferlay, J., and Pisani, P. 2005. "Global Cancer Statistics, 2002." *CA Cancer J. Clin.* 55: 74-108.
- [9] Chakraborty, S., Ganti, A. K., Marr, A., and Batra, S. K. 2010. "Lung Cancer in Women: Role of Estrogens." *Expert Rev. Respir Med.* 4 (4): 509-18.
- [10] Wakelee, et al. 2007. "Lung Cancer Incidence in Never Smokers." *J. Clin. Oncol.* 25: 472-8.

- [11] Couraud, S., and Wislez, M. 2013. "Cancers Broncho-pulmonaires des Non-fumeurs." *Rev. Mal. Resp.* 5: 482-9.
- [12] Foegle, J., Hedelin, G., Lebitasy, M. P., Purohit, A., Velten, M., and Quoix, É. 2007. "Specific Features of Non-small Cell Lung Cancer in Women: a Retrospective Study of 1,738 Cases Diagnosed in Bas-Rhin between 1982 and 1997." *J. Thorac. Oncol.* 2: 466-74.
- [13] <http://www.contrelecancer.ma/> The Foundation Lalla Salma of Cancer Prevention and Treatment.
- [14] Blanchon, F., Grivau, M., Collon, T., Zureik, M., Barbieux, H., and Piquet, J., et al. 2002. "Epidemiologic of Primary Bronchial Carcinoma Management in the General French Hospital Centers." *Rev. Mal. Respir.* 19: 727-34.
- [15] <http://www.e-cancer.fr/> Institut National du Cancer.
- [16] <http://www.cancer.ca/> société canadienne du cancer.