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## ORIGINAL RESEARCH

### Clinico- pathological and molecular characteristics of non small cell lung cancer: Differences by sex and hormonal status in Indian population

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#### ABSTRACT:

**Background:** Lung cancer remains the leading cause of cancer-related deaths among males and has increased in women in the last decades. The present study was conducted to assess clinico- pathological and molecular characteristics of non small cell lung cancer patients. **Materials & Methods:** The present study was conducted on 102 patients diagnosed with non-small cell lung cancer (NSCLC) of both genders. Hormonal status (premenopausal/postmenopausal), weight, histologic tumor type, disease stage, smoking, ECOG performance status, metastatic sites, and mutation profile for Kirsten rat sarcoma virus oncogene (KRAS) was recorded. **Results:** Out of 102 patients, males were 60 and females were 42. The mean age of males was 43.3 years and females was 45.1 years, 49 males and 12 females were smoker. Tobacco index in males was 16.7 and in females was 42.3. The difference was significant ( $P < 0.05$ ). Among smoker women, 5 were premenopausal and 7 were post menopausal, tobacco index was 8.8 in premenopausal and 33.4 in post menopausal. KRAS mutation status KRAS -ve in 84.7% premenopausal and +ve in 90.2% post menopausal. **Conclusion:** Males had higher prevalence than females. Smoking was contributing factor. Among females, post- menopausal had higher lung cancer.

**Key words:** Lung cancer, Postmenopausal, Smoking.

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#### INTRODUCTION

Lung cancer remains the leading cause of cancer-related deaths among males and has increased in women in the last decades. Lung cancer in women has become an important health problem, surpassing mortality from breast cancer and being the first cause of cancer-related death in EEUU and in some countries from Europe.<sup>1</sup>

It has been estimated to have a five-year overall survival rate of <15%,<sup>2</sup> with a rate of 2-22% for patients with stage IIIb-IV. In Iran, it ranks as the second and third cancer causing death in men and women, respectively.<sup>2</sup> Lung cancer accounted for 18.2% of all cancer deaths worldwide in 2008, with an age-standardized mortality rate of 19.4 per 100,000.<sup>3</sup> Lung cancer incidence decreased more rapidly among men than women and more rapidly among adults aged 35-44 years than other age groups. Lung cancer is divided into two main histological types, where non-small cell lung cancer (NSCLC) comprises around 85% of the cases and small-cell lung cancer (SCLC), the remaining 15% of the cases.<sup>4</sup>

Risk factors that might partially explain the increased incidence of lung cancer in women include: wood smoke exposure, cooking oil fumes exposure or second hand exposure to cigarette smoke, however exposure to these risk factors does not fully explain the increased incidence of lung cancer in women.<sup>5</sup> In the last years, it has been reported that estrogen and progesterone play an important role in lung cancer in women, mainly in the adenocarcinoma subtype, activating carcinogenic pathways.<sup>6</sup> The present study was conducted to assess clinico- pathological and molecular characteristics of non small cell lung cancer patients.

#### MATERIALS & METHODS

The present study was conducted in the department of Pulmonary Medicine. It comprised of 102 patients diagnosed with non-small cell lung cancer (NSCLC) of both genders. All were informed regarding the study. Ethical approval was obtained from institute prior to the study.

General information such as name, age, gender etc. was recorded. Hormonal status (premenopausal/postmenopausal), weight, histologic tumor type, disease stage, smoking, ECOG

performance status, metastatic sites, and mutation profile for Kirsten rat sarcoma virus oncogene (KRAS) was recorded. Smoking index was obtained by multiplying the number of cigarettes smoked per day by the number of years the patient

reported that he/she had smoked [(# cigarettes per day)(years smoking)/20] and reported as pack-year. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

Total- 102		
Gender	Males	Females
Number	60	42

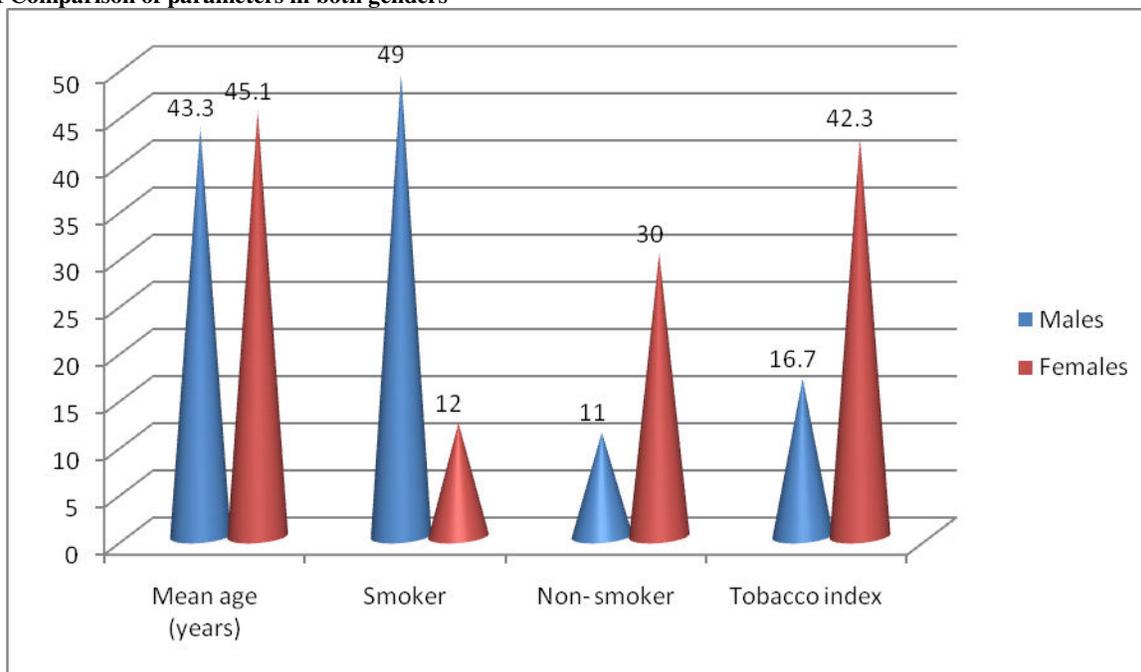
Table I shows that out of 102 patients, males were 60 and females were 42.

**Table II Comparison of parameters in both genders**

Parameters	Males	Females	P value
Mean age (years)	43.3	45.1	0.52
Smoker	49	12	0.01
Non- smoker	11	30	0.02
Tobacco index	16.7	42.3	0.01

Table II, graph I shows that mean age of males was 43.3 years and females was 45.1 years, 49 males and 12 females were smoker. Tobacco index in males was 16.7 and in females was 42.3. The difference was significant (P< 0.05).

**Graph I Comparison of parameters in both genders**



**Table III Menopausal status of female patients**

Parameters	Pre- menopausal	Post- menopausal
Smokers	5	7
Non smokers	14	16
Tobacco index	8.8	33.4
KRAS mutation status KRAS -ve	84.7%	90.2%
KRAS +ve	15.3%	9.8%

Table III shows that among smoker women, 5 were premenopausal and 7 were post menopausal, tobacco index was 8.8 in premenopausal and 33.4 in post menopausal. KRAS mutation status KRAS –ve in 84.7% premenopausal and +ve in 90.2% post menopausal.

## DISCUSSION

Lung cancer presentation, behavior and response to treatment seem to differ between women and men. For instance, the median age for lung cancer diagnosis in women is lower compared to men. Women with lung cancer more often have no history of smoking and the predominant subtype is adenocarcinoma, frequently associated with mutations in epidermal growth factor receptor gene (EGFR). In addition, women show better response to chemotherapy and longer overall survival, regardless of the clinical stage at diagnosis, compared to men.<sup>7</sup> The present study was conducted to assess clinico- pathological and molecular characteristics of non small cell lung cancer patients.

In this study, out of 102 patients, males were 60 and females were 42. We observed that mean age of males was 43.3 years and females were 45.1 years, 49 males and 12 females were smoker. Tobacco index in males was 16.7 and in females was 42.3.

Rodriguez-Lara et al<sup>8</sup> did retrospective study among 104 NSCLC patients. Clinic-pathologic data was recorded and survival outcomes were compared between male and female sex patients, and further by pre and postmenopausal status in females. Women were significantly more likely to be non-smokers ( $p<0.001$ ), had higher frequency of wood-smoke exposure ( $p<0.001$ ), EGFR-sensitizing mutations ( $p<0.001$ ), had better performance status ( $p=0.020$ ) and had a better overall survival (OS) compared to men ( $p=0.021$ ). Differences were found also by hormonal status, postmenopausal women had a longer OS compared to premenopausal women (31.1 vs. 19.4 months  $p=0.046$ ).

We found that among smoker women, 5 were premenopausal and 7 were post menopausal, tobacco index was 8.8 in premenopausal and 33.4 in post menopausal. KRAS mutation status KRAS -ve in 84.7% premenopausal and +ve in 90.2% post menopausal.

Arrieta et al<sup>9</sup> analyzed the clinicopathological features of patients with non-small-cell lung cancer (NSCLC). Sex, age, histopathology, location of the tumor, treatment, sites of metastasis and overall survival of the patients were studied. EGFR mutations were analyzed using the DxS kit with Multiplex allele specific real-time PCR×29 primers (ARMS Method), DxS Scorpion and ARMS assay. Mean age of the patients at diagnosis was 60 years. 51 (79.7%) patients were men. 34.3% were in their sixth to seventh decade of life (50-69 years). 40 (68.75%) patients had distant metastasis to bone and liver as the most common sites. Adenocarcinoma, squamous cell carcinoma and large cell carcinoma were observed in 68.8%, 23.3%, and 7.9% of the patients, respectively. 3-year survival rate was 25% and the mean overall survival (OS) was 16 months for all patients.

Previous studies which have considered hormonal status among women with lung cancer have reported that premenopausal

women presented with more advanced stage-disease at the time of diagnosis, less differentiated tumors, distant metastases and had a worse prognosis compared to postmenopausal women and men.<sup>10</sup>

## CONCLUSION

Authors found that males had higher prevalence than females. Smoking was contributing factor. Among females, postmenopausal had higher lung cancer.

## REFERENCES

1. Wong MCS, Lao XQ, Ho KF, Goggins WB, Tse SLA. Incidence and mortality of lung cancer: global trends and association with socioeconomic status. *Sci Rep.* 2017;7:14300.
2. Chen XQ, Zheng LX, Li ZY, Lin TY. Clinicopathological significance of oestrogen receptor expression in non-small cell lung cancer. *J Int Med Res.* 2017;45(1):51-8.
3. Niikawa H, Suzuki T, Miki Y, Suzuki S, Nagasaki S, Akahira J, *et al.* Intratumoral estrogens and estrogen receptors in human non-small cell lung carcinoma. *Clin Cancer Res.* 2008;14(14):4417-26.
4. Eilstein D, Eshai K. Lung and breast cancer mortality among women in France: future trends. *Cancer Epidemiol.* 2012;36:341-8.
5. Jemal A, Miller KD, Ma J, Siegel RL, Fedewa SA, Islami F, *et al.* Higher lung cancer incidence in young women than young men in the United States. *N Engl J Med.* 2018;378:1999-2009.
6. Pineros M, Sierra MS, Forman D. Descriptive epidemiology of lung cancer and current status of tobacco control measures in Central and South America. *Cancer Epidemiol.* 2016;44(suppl 1): 90-9.
7. Jemal A, Bray F, Center MM, Ferlay J, Ward E, Forman D. Global cancer statistics. *CA Cancer J Clin.* 2011;61:69-90.
8. Rodriguez-Lara V, Hernandez-Martinez JM, Arrieta O. Influence of estrogen in non-small cell lung cancer and its clinical implications. *J Thorac Dis.* 2018;10(1):482-97.
9. Arrieta O, Campos-Parra AD, Zuloaga C, Aviles A, Sanchez-Reyes R, Manriquez ME, *et al.* Clinical and pathological characteristics, outcome and mutational profiles regarding non-small-cell lung cancer related to wood-smoke exposure. *J Thorac Oncol.* 2012;7(8):1228-34.
10. Kim C, Gao YT, Xiang YB, Barone-Adesi F, Zhang Y, Hosgood HD, *et al.* Home kitchen ventilation, cooking fuels, and lung cancer risk in a prospective cohort of never smoking women in Shanghai, China. *Int J Cancer.* 2015;136:632-8.