

INTRODUCTION

Lung cancer (LC) remains the leading cause of cancer mortality worldwide, with a disproportionate burden in low- and middle-income countries. While tobacco is the primary risk factor, a significant proportion of LC cases occur in never-smokers, suggesting the role of alternative environmental exposures. In developing countries, wood smoke exposure (WSE) from biomass fuel used for cooking and heating remains highly prevalent and represents a potentially underrecognized carcinogenic factor. Biomass combustion releases multiple toxic compounds, including polycyclic aromatic hydrocarbons, which have been associated with lung carcinogenesis. This study aims to evaluate the clinical, epidemiological, and molecular characteristics of patients with NSCLC exposed to wood smoke.

METHODS

We conducted a retrospective analysis of patients diagnosed with non-small cell lung cancer (NSCLC) at a State Oncology Center in Mexico. Demographic, clinical, and exposure data were collected, including age at diagnosis, sex, tobacco use, and history of wood smoke exposure. Histologic subtype and molecular characteristics, including EGFR mutation status, were also analyzed.

DISCUSSION AND CONCLUSION

WSE accounts for a substantial proportion of LC cases in this cohort and emerges as a clinically significant and underrecognized risk factor among never-smokers in Mexico. The strong predominance of women and the high frequency of EGFR mutations among exposed patients suggest the presence of a distinct epidemiological and molecular subtype associated with biomass exposure. These findings underscore the urgent need to recognize WSE as a major contributor to LC burden in developing countries and to implement targeted public health strategies aimed at reducing household biomass exposure.

REFERENCES & ACKNOWLEDGEMENTS



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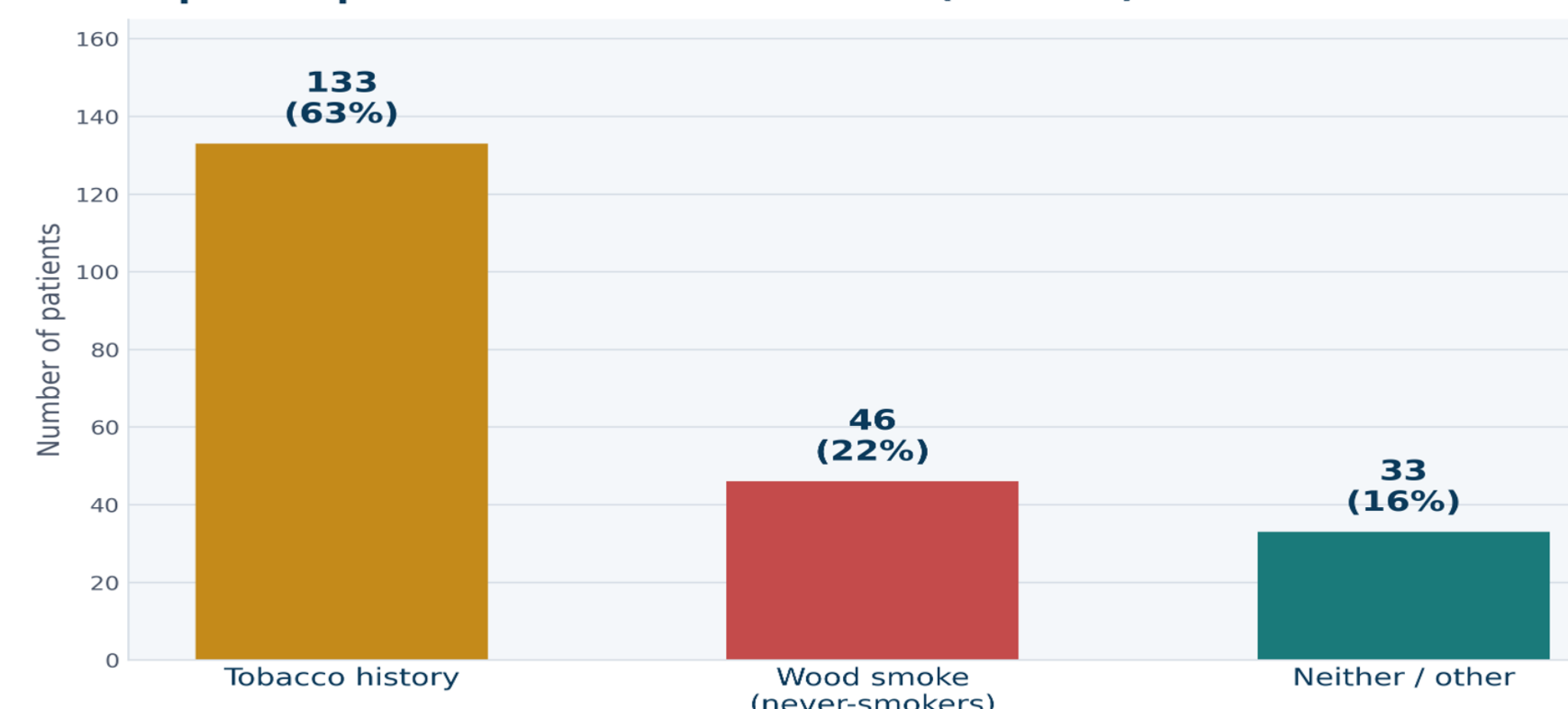
RESULTS

A total of 210 patients with NSCLC were included, with a mean age of 68 years. A history of tobacco use was reported in 133 patients (63%), while the remaining patients were never-smokers.

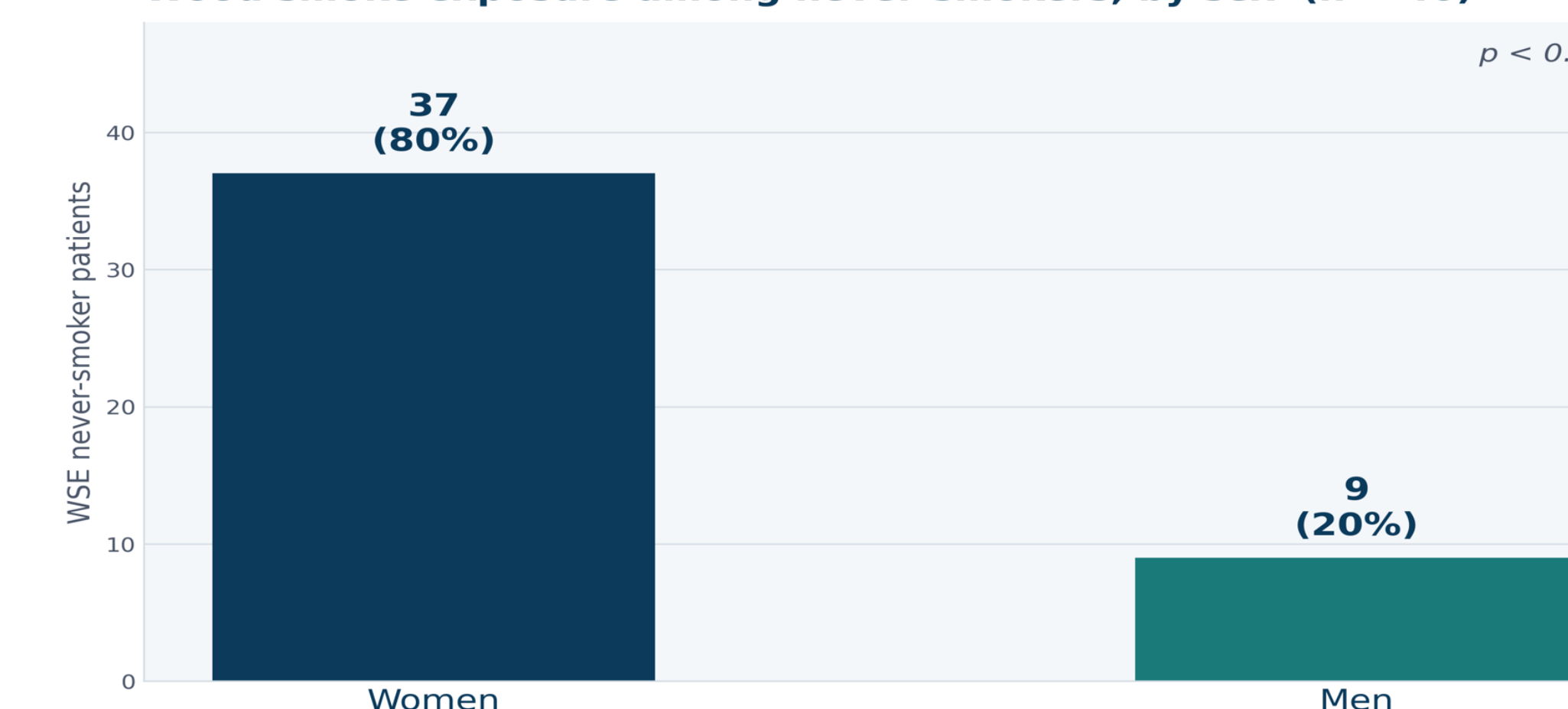
Chronic wood smoke exposure was identified in 46 patients (22%), representing a considerable proportion of the overall cohort. Importantly, all patients with wood smoke exposure were never-smokers, supporting the role of biomass exposure as an independent risk factor for lung cancer.

Among patients with wood smoke exposure, there was a marked predominance of women (45 women vs. 9 men), consistent with prolonged domestic exposure patterns in developing countries. Histologically, the vast majority of tumors corresponded to adenocarcinoma, with only 6 cases of squamous cell carcinoma, aligning with the known profile of lung cancer in never-smokers. From a molecular perspective, EGFR mutations were identified in 18 patients with wood smoke exposure, with a striking predominance in women (17 women vs. 1 man). This finding suggests a distinct molecular phenotype associated with biomass exposure and further supports the biological plausibility of wood smoke as a carcinogenic driver.

Exposure profile in the NSCLC cohort (N = 212)



Wood smoke exposure among never-smokers, by sex (n = 46)



EGFR mutations among WSE patients (18 of 46 cases)

