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"Sociodemographic and Clinical Factors Associated with Bone Metastasis and Survival Among Distant-Stage Lung Cancer Patients in Louisiana"

Background: Bone is a common site of metastasis in late-stage lung cancer, affecting up to 30% to 48% of patients in the US. Bone metastasis (BM) leads to skeletal-related events, worsening prognosis and survival. Little is known about how sociodemographic and clinical factors are associated with BM and outcomes, particularly in Louisiana, a state with a high lung cancer incidence and mortality.

Methods: We conducted a population-based retrospective cohort study of Louisiana patients diagnosed with distant-stage lung cancer in 2011-2021 using data from the Louisiana Tumor Registry. The primary outcome was BM at diagnosis; the secondary outcomes were overall and cause-specific death (OD and CSD) by metastasis site (BM-only, BM + others, non-BM). Exposures included sociodemographic (age, race, sex, insurance, census-tract poverty, urban/rural residence) and clinical factors (AJCC stage, histology, and treatment). Logistic regression identified factors associated with BM, and Cox proportional hazards models assess factors associated with the risk of OD and CSD through December 2022.

Results: Of 13,233 patients, 12.2% had BM only and 22.5% bone plus other site(s). Young age, male sex, and adenocarcinoma or small-cell tumors were significantly associated with increased odds of BM at diagnosis, while current smoking, and obesity were significantly linked to lower odds. BM predicted a higher risk of OD (HR=1.35; 95% CI: 1.30-1.41) and CSD (HR=1.40; 95% CI: 1.35-1.46), adjusting for sociodemographic and clinical factors, compared to those without BM, regardless of whether BM occurred alone or with other metastases. Among patients with BM, older age, male sex, smoking, and none/unknown insurance, and small-cell and other non-small-cell tumors were linked to a higher risk of OD and CSD, whereas overweight BMI and adenocarcinoma were associated with a lower risk of death.

Conclusion: BM affected over one-third of distant-stage lung cancer patients in Louisiana. Younger age, male sex, and certain tumor types predicted BM, which were independently associated with increased mortality. Among patients with BM, survival differed by age, sex, smoking, insurance status, BMI, and histology, highlighting disparities in outcomes. These findings underscore the importance of addressing variations in BM burden across diverse populations.