P-12

Clinical Profile of Brain Metastases in Lung and High-Grade Neuroendocrine Neoplasms

Joseph Watts[1,2], Sanjay Shankar[1,2], Harry Menon, DO[2], Katharine Thomas, MD[2]

[1]UNR School of Medicine; [2]Renown Health

BACKGROUND

Brain metastases are an uncommon but significant complication of neuroendocrine neoplasms (NENs). While routine brain imaging is recommended for selected aggressive pulmonary neuroendocrine carcinomas, it is not routinely performed in patients with well-differentiated neuroendocrine tumors (NETs). Real-world data describing the distribution of diagnosis-time brain metastases across the spectrum of NETs and NENs remain limited. We evaluated the prevalence, clinicopathologic characteristics, treatment patterns, and survival associated with brain metastases at diagnosis in a large community-based cohort.

METHODS

We performed a retrospective study of 386 patients with NETs/NENs treated at a large community cancer center. Brain metastases were defined using the diagnosis-time brain metastasis variable; subsequent CNS progression was analyzed separately. Prespecified cohorts included lung-primary, high-grade, and combined lung/high-grade disease. Overall survival (OS) was measured from diagnosis until death or last follow-up. Radiation records were reviewed to identify any radiation therapy and possible brain-directed radiation. Survival was estimated using Kaplan-Meier methods and compared with the log-rank test; adjusted Cox modeling was exploratory.

RESULTS

Among 386 patients, brain metastases at diagnosis were identified in 43 (11.1%). Notably, all diagnosis-time brain metastases occurred within the predefined lung/high-grade cohort (43/257, 16.7%), whereas no patients outside this group had brain metastases at presentation. Brain metastases occurred in 42/217 (19.4%) lung-primary patients and 42/211 (19.9%) high-grade patients. Among affected patients, 42/43 (97.7%) had pulmonary primary tumors, 38/43 (88.4%) had small cell carcinoma, and 42/43 (97.7%) had poorly differentiated/high-grade neuroendocrine carcinoma. Median age was 69 years, and 22 patients (51.2%) were male. Extracranial metastatic disease was present in 28/43 (65.1%), most commonly involving distant lymph nodes (23.3%), liver (20.9%), bone (20.9%), and other metastatic sites (27.9%). Among 36 evaluable patients, 33 (91.7%) received radiation therapy and 29 (80.6%) had documentation consistent with brain-directed radiation.

Within the lung/high-grade cohort (n=255; 131 deaths), diagnosis-time brain metastases were associated with significantly shorter median OS compared with patients without brain metastases (4.9 vs. 32.4 months; log-rank p=0.005). Exploratory evaluation of subsequent CNS progression likewise identified brain metastases only among patients with lung/high-grade disease.

CONCLUSIONS

In this large community cohort, diagnosis-time brain metastases demonstrated striking disease specificity, occurring exclusively in pulmonary and/or high-grade neuroendocrine neoplasms and not among patients with well-differentiated or extrapulmonary NETs. These findings support current selective CNS staging practices and reinforce that routine brain imaging appears unnecessary for asymptomatic patients with well-differentiated NETs, while emphasizing the importance of brain evaluation in aggressive pulmonary/high-grade neuroendocrine neoplasms. Prospective studies are warranted to validate these findings and further refine risk-based CNS imaging strategies.

ABSTRACT ID #36647