Association of Immune Checkpoint Inhibitors (ICI) And Venous Thromboembolism (VTE) in Non-Small Cell Lung Cancer (NSCLC)– A Single Healthcare System Experience.

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Background: NSCLC and chemotherapy are well-known predisposing factors for VTE. There are conflicting data regarding the association between ICI and VTE in patients with NSCLC. In a retrospective study by Khorana et al. in 2299 NSCLC patients, VTE incidence was numerically lower for patients receiving ICI than chemotherapy. In another study by Attia et al., in 514 patients with lung cancer, there was an increased incidence of VTE with ICI. We conducted a retrospective chart review to further assess the relationship between VTE and ICI in patients with NSCLC who were treated at our facility.

Methods: All adult patients >18 years of age with NSCLC who received cancer treatment in our academic health system between January 2011- January 2021 were extracted from the tumor registry. Information was obtained about the type of cancer treatment, deep venous thrombosis (DVT) or pulmonary embolism (PE) occurrence, and associated comorbidities. Patients were divided into two groups – chemotherapy and combined ICI-chemotherapy. Fisher exact tests were used to compare categorical covariates by VTE status, while Wilcoxon rank-sum tests were used for continuous covariates. Multivariable logistic regression was performed to adjust for potential confounding.

Results: 370 patients with NSCLC were included in the study. No statistically significant difference was found between VTE incidence and race, histology, or gender. There was a decreased VTE rate among non-advanced cancer (6.2% vs. 18.1%, p=.015) and squamous cell histology (7.5% vs. 28.1%, p=.009). Although the rate of VTE increases slightly in ICI/chemotherapy (17.4%, CI: 11.2%-25.8%) when compared to chemotherapy (15.3% %, CI: 11.2%-20.4%), this was not statistically significant (p=.645). After adjusting for sex, histology, and race, ICI/chemotherapy group had a statistically insignificant increase in odds of VTE events (adjusted OR = 1.24 95% CI = 0.67-2.3, p=.498) compared to the chemotherapy group. The odds of death were significantly lower in patients with ICI/chemotherapy (aOR=.33, 95% CI = .2-.54, p=.001). The median time between ICI use and VTE was 21 days (CI: 12.5-65), while the median time between chemotherapy and VTE was 65.5 days (CI=36.5-146.5).

Conclusion: In patients with NSCLC who were treated at our facility, there was no significant VTE difference in patients related to race or gender identity. Likewise, there was no statistical difference in the incidence of VTE in the ICI/chemotherapy and chemotherapy groups. Multivariable logistic regression of various groups to the vital status of the patients shows a statistically significant decrease in death in ICI/chemotherapy group, which is a potential censoring

event for VTE. Further studies, including meta-analyses, are required to evaluate the association further, given conflicting results on prior retrospective studies.