COVID-19 and acute heart failure among patients with cancer

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Background: Patients with cancer represent a uniquely vulnerable population not only with higher susceptibility to COVID-19 but also at increased risk for death. However, detailed information on causes of death and the contribution of pre-existing health conditions to death yet is missing.

Purpose: This study focuses on the implications of COVID-19 in the cardiovascular health of patients with cancer by assessing the relation between cancer and de novo acute heart failure (AHF) with in-hospital mortality.

Methods: The initial population consisted of 3968 patients included in the ISACS COVID-19 registry between March 2020 and February 2022. Of these, 546 patients with chronic HF were excluded, leaving a final population of 3422. Patients were divided in two groups according to the presence or absence of a cancer diagnosis at the time of hospitalization for COVID-19. Primary outcomes were incidence of in-hospital mortality or AHF during hospitalization. Association between cancer and outcomes was estimated using multivariable logistic regression analyses. Subsidiary analysis was conducted to evaluate differences between patients with prior vs active cancer.

Results: Of the 3422 patients included in the study, 468 patients had cancer (8.2% active, 5.5% past cancer). Cancer patients were older (68.9±13.4 vs 63.3±15.6, p-value <0.001) and more likely to be female (50.4% vs 39.1%, p-value <0.001). They presented more frequently with a history of chronic obstructive pulmonary disease (12.3% vs 7.6%, p-value = 0.001). When considering outcomes, cancer patients had a significantly higher incidence of in-hospital mortality (27.7% vs 19.2%; p-value <0.001). This despite the presence of a numerically higher mean PiO2/FiO2 (281±108.8 vs 267.05±122.5, p-value = 0.11) on admission and a lower rate of X-ray findings of interstitial pneumonia (60% vs 70.5%, p-value <0.001) than their non-oncological counterparts, as well as similar use of mechanical ventilation (30.6% vs 35.0%, p value=0.14). The association between cancer and death persisted when adjusting for demographic, laboratory findings and in-hospital treatment (OR: 1.46; 95% CI: 1.11–1.94; p value=0.01). Cancer patients also had higher rates of AHF (9.6% vs 4.7%, p-value <0.001) during hospitalization. This association was independent from presence of cardiovascular risk factors or comorbidities (OR: 1.61; 95% CI: 1.07–2.43; p value=0.02). When restricting the analysis to the cancer population, AHF appeared to be significantly associated with death (OR: 2.41; 95% CI 1.18–4.95; p-value = 0.01), but this correlation persisted only in patients affected by active cancer in age and sex adjusted analyses (OR: 4.27; 95% CI: 1.51–12.07; p value=0.01 vs 1.20; 95% CI: 0.38–3.76; p-value = 0.75).

Conclusions: The incidence of AHF in cancer patients with COVID-19 is high. Patients with active cancer are also at high risk for mortality. This has implications for cardiac monitoring and chemotherapy administration during COVID-19.