Abstract ID e-Poster 1577P
Session: 247-14 e-Poster Display

Early mortality linked to COVID-19 in cancer patients as compared to historical control in pre-pandemic times

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Background

The COVID19 pandemic remains a public health emergency of global concern. with higher mortality rates in cancer patients as compared to the general population. However. early mortality of COVID19 in cancer patients has not been compared to historical real-world data from oncology population in pre-pandemic times.

Methods

Longitudinal multicenter cohort study of patients with cancer and confirmed COVID19 from Oncoclínicas Group in Brazil from March to December 2020. The primary endpoint was 30-day mortality after isolation of the SARS-CoV-2 by RT-PCR. As historical control. we selected patients from Oncoclínicas Data Lake treated before December 2019 and propensity score-matched to COVID19 cases (3:1) based on the following clinical characteristics: age. gender. tumor type. disease setting (curative or palliative). and time from diagnosis of cancer (or metastatic disease) to COVID19 infection. The overall survival calculation in the Data Lake Control Group was based on a Landmark Analysis considering median time from diagnosis of cancer (or metastatic disease) and COVID-19 infection. The statistical significance of the proportion of deaths between the groups and overall survival was measured using Fisher's Exact Test and Cox's proportional-hazards model. Respectively, along with the respective test powers based on a two sided hypothesis and a 1% margin of error.

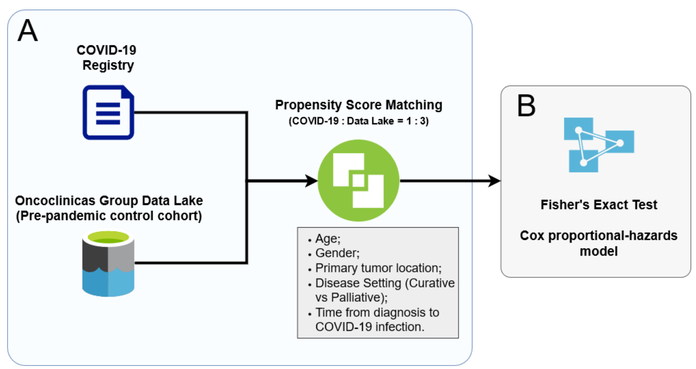


Figure 1: Study methodology with (A) propensity score matching and (B) statistical testing

Results

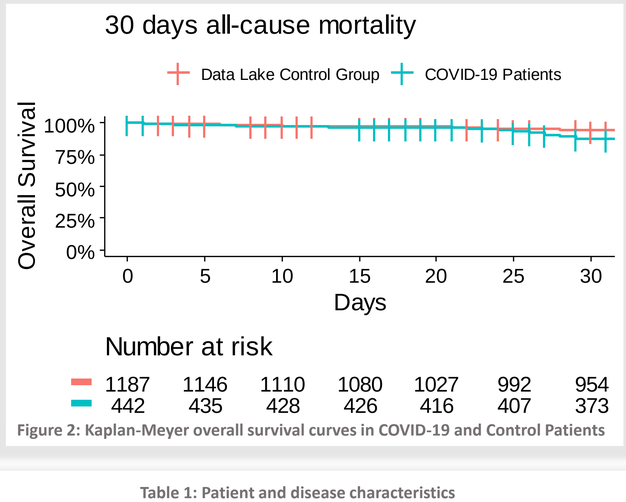


Figure 2: Kaplan-Meyer overall survival curves in COVID-19 and Control Patients

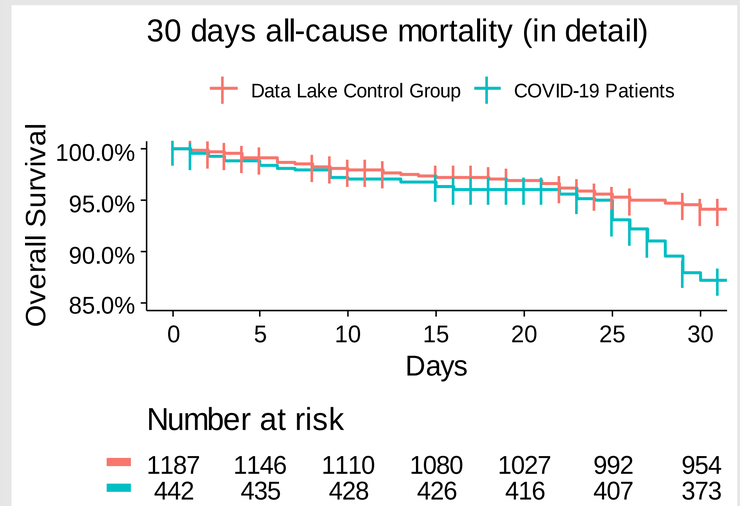


Figure 3: Kaplan-Meyer overall survival curves in COVID-19 and Control Patients in detail

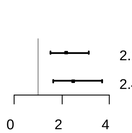
Table 1: Patient and disease characteristics

Variables	COVID-19 Patients (n = 442 | 27.1%)	Data Lake Control Group (n = 1.187 | 72.9%)
Age (Mean±SD)	60±16	62±16
Median time from diagnosis or metastasis to infection/landmark time in Months **(Min-Max)**	10 (0 - 238)	12 (0 - 224)
Death Status		
Alive	387 (87.6%)	1.123 (94.6%)
Dead	55 (12.4%)	64 (5.4%)
Sex		
Female	291 (65.8%)	776 (65.4%)
Male	151 (34.2%)	411 (34.6%)
Disease Setting		
Curative	209 (47.3%)	627 (52.8%)
Palliative	233 (52.7%)	560 (47.2%)
Tumor Site		
Breast	158 (35.7%)	421 (35.5%)
Gastrointestinal	70 (15.8%)	204 (17.2%)
Genitourinary	54 (12.2%)	156 (13.1%)
Hematological	62 (14%)	137 (11.5%)
Respiratory	43 (9.7%)	120 (10.1%)
Gynecological	22 (5%)	65 (5.5%)
Connective Tissue	17 (3.8%)	43 (3.6%)
Other	16 (3.6%)	41 (3.5%)

Table 2: Univariate testing for 30-days all-cause mortality

Statistical analysis on 30-days all-cause mortality

Statistical Tests	Control Group	COVID-19 Patients	HR or OR (95% CI)	p-value	Power
Mortality Rate	5.3%	12.44%			
Fisher's Exact Test			2.18 (1.52 - 3.12)	<0.001	97.46%
Cox Regression			2.49 (1.63 - 3.70)	<0.001	99.74%



Conclusions

Cancer patients with COVID19 have an excess mortality 30 days after the infection when compared to a matched cancer population from pre-pandemic times and the general population with COVID19, reinforcing their inclusion in the priority list for vaccination in public health strategies.

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