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Hospital end-of-life care aggressiveness in adult solid tumour patients pre and post COVID-19: retrospective multicentre cohort study

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Dear Editor,

The COVID-19 pandemic has had a considerable impact on cancer care. Studies have looked at how the pandemic affected palliative care delivery for cancer patients,(1) but little is known on access to palliative care. Besides, aggressiveness of care is prevalent near the end-of-life (EOL) of cancer patients in France and other countries, and little is known on whether COVID affected this situation.

To address this gap, we conducted an analysis of end-of-life care intensity and access to palliative care among solid cancer patients in the Paris area, before and after the initial waves of the COVID-19 pandemic.

METHODS

We conducted a retrospective multicenter cohort study on the Clinical Data Warehouse (CDW) of Greater Paris University Hospitals (Assistance Publique - Hôpitaux de Paris, APHP). Our study focused on inpatients with solid metastatic cancer who died in one of APHP's 28 teaching hospitals with data available, between March 1st, 2019, and February 29th, 2020 (pre-COVID group) and between March 1st, 2020, and February 28th, 2021 (post-COVID group). Hospital outpatients receiving ambulatory hospital palliative care were excluded. Patients were included if their care history since January 2017 comprised an ICD-10 code designating metastatic cancer (C78-79) as a primary diagnosis.

Markers of aggressive care defined by Earle *et al.* (2) were extracted from claims data. Diagnoses were coded using the International Classification of Diseases (ICD, 10th edition), and medical procedures using the French Common Classification of Medical Procedures (CCAM, 11th edition). Referrals to a palliative care team within the last 30, 60, and 90 days of life were identified using ICD-10 code Z515. We computed these markers in the 10 hospitals with the highest number of included patients. During the last two years of patient's life, we calculated the median duration between the first occurrence of a Z515 code in the patient's care trajectory, and the patient's death.

Categorical variables were compared using a χ^2 test. Statistical analysis was conducted using Python 3.7, with significance set at $p < 0.05$. This study was approved by APHP's

Scientific and Ethics Committee (IRB00011591) (approval CSE 20-0055_COVONCO-AP) on May 15th, 2020.

RESULTS

Table 1 summarizes the characteristics of the 5,359 metastatic cancer inpatients included in the study. Supp Figure 1 displays the monthly number of hospital inpatient deaths, with a small decrease post-COVID. A total of 483 patients (9.0%) received intra-venous anticancer treatment in the last 14 days before their death, with no significant difference between pre- and post-COVID periods. In the last 30 days of life, 2,052 (38.3%) patients had at least two distinct hospital visits, 451 (8.4%) patients had at least two visits to the emergency department, 808 (15.1%) patients were admitted at least once in ICU, and 3,647 (68.1%) were referred to a palliative care team. None of these indicators differed significantly between groups. The median time between the first referral to palliative care and death was 16 days (IQR, 7-39) in both groups. Supp Figure 2 shows the percentage of patients who received palliative care in the last 30 days of life before and after the COVID outbreak. Supp Figure 3 displays the percentage of patients referred to a palliative care team in the last 30 days of life before and after the COVID outbreak, in the 10 hospitals with the highest number of patients. Noticeable variations in proportions (ranging from 60 to 80% of patients) and in the extent of pre- vs. post-COVID differences (0 to 15%) were observed.

DISCUSSION

This multicentric cohort study of 5,359 patients, found no significant difference between the pre- and post-COVID periods in markers of aggressiveness in EOL care. Access to palliative care in the last 30, 60 and 90 days did not differ between pre- and post-COVID periods. The time between first palliative care referral and patient death did not differ between the groups. The study's high access to palliative care contrasts with a recent nationwide analysis, likely due to our narrower focus on inpatient deaths.(3)

The lack of difference between the pre- and post-COVID periods on markers of aggressiveness in EOL care suggests either resilient care practices despite the circumstances caused by the health crisis, or redistribution of care to patients with the highest probability of

survival during this period of limited resources. Access to palliative care was comparable during the two periods, despite reduced access to care during the COVID period. This may reflect an increased relative use of palliative care necessitated by the prioritization of acute care for patients with the best chance of survival, or it may indicate the resilience of cancer care at APHP to the COVID-19 crisis. Therefore, healthcare providers needed to efficiently manage symptoms of patients who did not qualify for acute or intensive care.

A recent review (36 studies, 14,427 patients from 16 countries) showed that palliative patients management during the pandemic was often interrupted or delayed, with an increase in invasive procedures noted.(1) While most studies were small and single-center, a Spanish cohort study reported a decrease in hospital palliative care in favor of transfers to home. Access to palliative care remained stable in our study.(4) A large registry-based study in Ontario found a surge in home deaths, accompanied by increased socioeconomic disparities in palliative care access during the COVID period.(5)

Our study has several limitations. Our focus on APHP data restricted our analysis to patients who died within APHP hospitals, excluding those who died at home, in hospice care, or in other hospitals.. This may account for a substantial proportion of cancer patient deaths, with potentially different care pathways from the patients studied in our study. Moreover, defining access to palliative care solely based by the Z515 code may obscure differences in the actual care delivered.(3)

CONCLUSION

In this retrospective study of 5,676 solid cancer patients who died at APHP before and after the COVID pandemic, we found no differences in access to palliative care or in markers of aggressiveness. Aggressive EOL care remains widespread irrespective of COVID-19.

Table 1. Patient characteristics, indicators of aggressive care, and access to palliative care.

	TOTAL n = 5,359	BEFORE COVID n = 2,814	AFTER COVID n = 2,545	p-value
Age at death (median; IQR)	69 (60-79)	69 (60-79)	70 (60-79)	
Women, n (%)	2,243 (41.9)	1,198 (42.6)	1,045 (41.1)	
Primary tumor site, n (%)				
- Lung	1,164 (21.7)	605 (21.5)	559 (22.0)	
- Breast	402 (7.5)	201 (7.1)	201 (7.9)	
- Colorectal	631 (11.8)	339 (12.0)	292 (11.5)	
- Prostate	235 (4.4)	121 (4.3)	114 (4.5)	
- Bladder	204 (3.8)	96 (3.4)	108 (4.2)	
- Pancreas	545 (10.2)	295 (10.5)	250 (9.8)	
- Gastric	216 (4.0)	109 (3.9)	107 (4.2)	
- Biliary duct	192 (3.6)	105 (3.7)	87 (3.4)	
- Liver	250 (4.7)	130 (4.6)	120 (4.7)	
- Others	1,580 (29.5)	873 (31.0)	707 (27.8)	
In last 14 days of life				
- administration of intra-veinous anticancer treatment	483 (9.0)	253 (9.0)	230 (9.0)	0.99
In the last 30 days of life				
- 2 or more admissions in standard hospital stay	2,053 (38.3)	1,088 (38.7)	964 (37.9)	0.57
- 2 or more emergency room visits	451 (8.4)	232 (8.2)	219 (8.6)	0.67
- 1 or more admissions in intensive care unit	816 (14.3)	435 (15.5)	373 (14.7)	0.44
Contact with hospital palliative care team in the last				
- 30 days of life	3,647 (68.1)	1,928 (68.6)	1,719 (67.5)	0.44
- 60 days of life	4,031 (75.2)	2,139 (76.0)	1,892 (74.3)	0.17
- 90 days of life	4,109 (76.7)	2,176 (77.3)	1,933 (76.0)	0.25
Delay between first contact with palliative care team and death (days) (median; IQR)		16 (7-39)	16 (7-38)	

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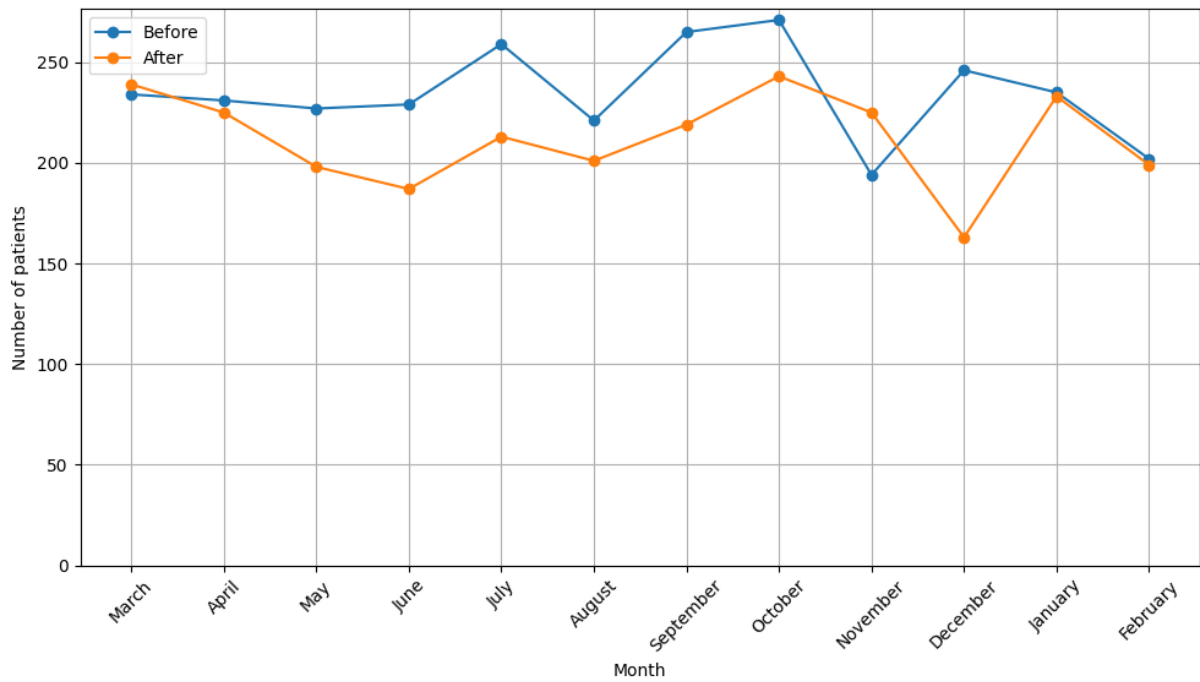
CONTRIBUTORSHIP STATEMENT

TCC, EK and GL designed the study. MEM, AC and SP performed data analysis. All authors contributed to the interpretation of results. TCC wrote the original draft. All authors reviewed and edited.

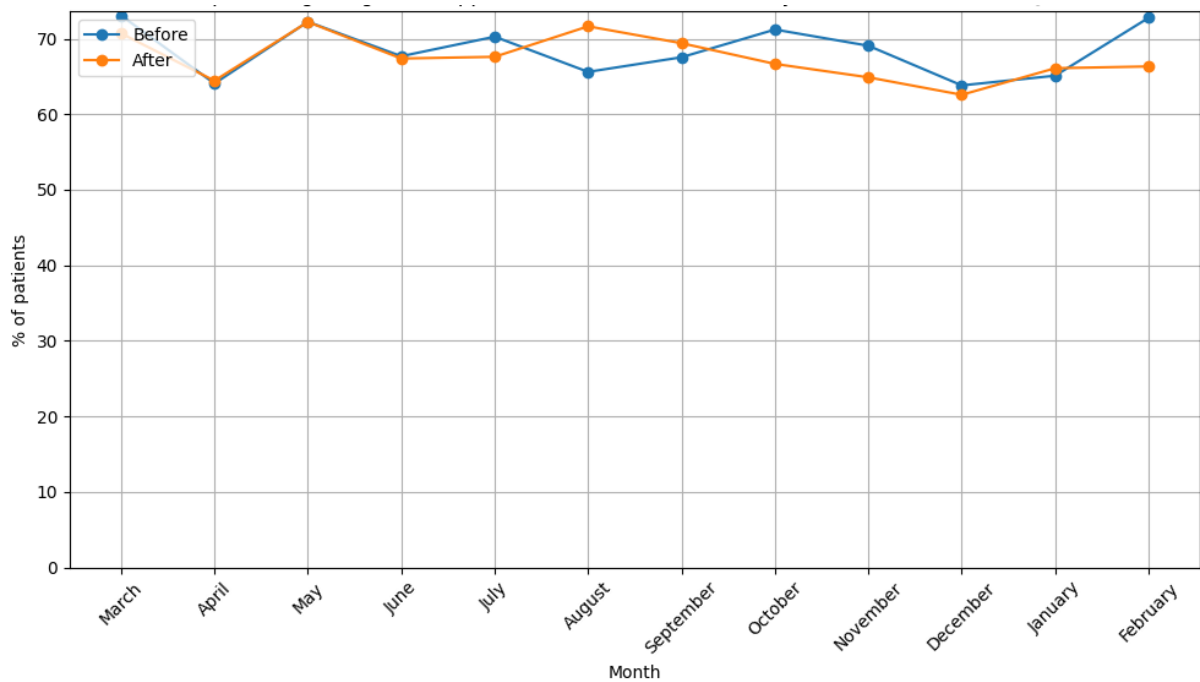
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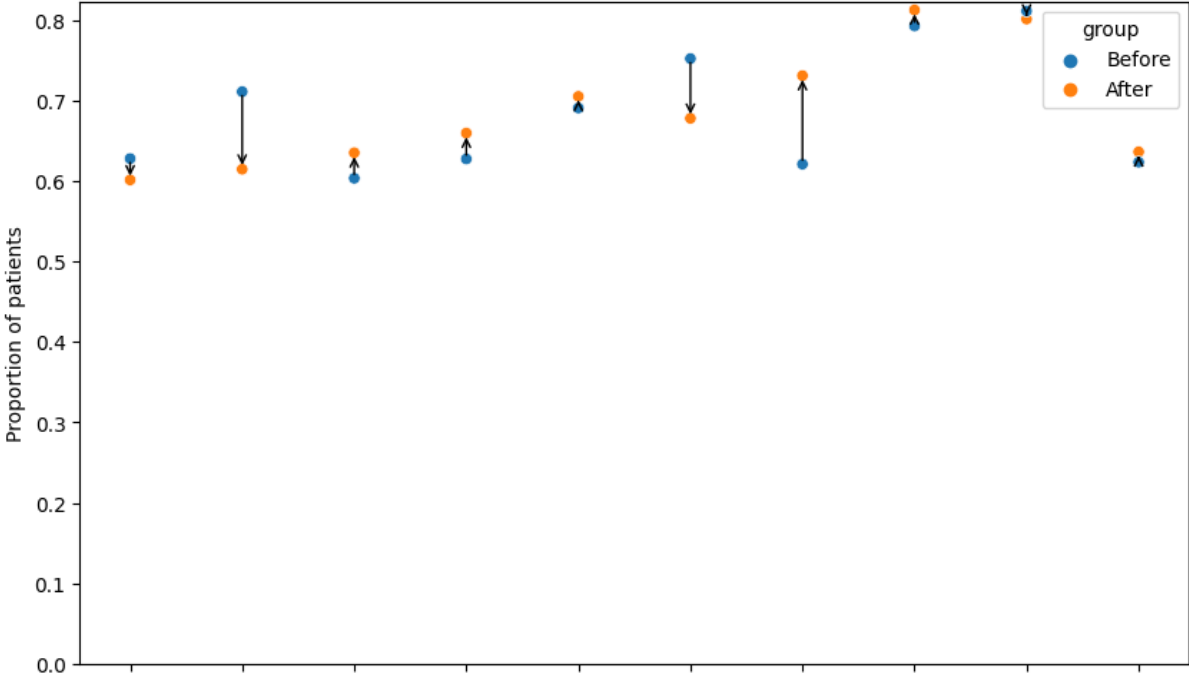
Supplementary materials



Supp Figure 1. Monthly number of in-hospital deaths of patients with metastatic cancer, in the pre- and post- COVID periods.



Supp Figure 2. Monthly proportion of patients who received palliative care in their last 30 days of life, in the pre- and post- COVID periods.



Supp Figure 3. Percentage of patients referred to a palliative care team in their last 30 days of life in the 10 hospitals having the highest number of patients, in the pre- and post- COVID periods.