Neuro-Oncology
24(2), 326–328, 2022 | https://doi.org/10.1093/neuonc/noab258 | Advance Access date 24 November 2021

Letter to the Editor

Patients with primary brain tumors and COVID-19: A report from the Dutch Oncology COVID-19 Consortium

The coronavirus disease 2019 (COVID-19) pandemic has significantly impacted cancer care. The Dutch Oncology COVID-19 Consortium (DOCC) registry was initiated in 45 hospitals in the Netherlands to identify risk factors for a fatal outcome of COVID-19 in patients with cancer. This observational cohort study has been designed as a national quality of care registry and has been approved by the ethics committee and the Privacy Knowledge Office at Erasmus Medical Centre.[1] A questionnaire was developed to collect pseudonymized patient data (Supplementary Appendix 1). The first analysis showed an increased risk of a fatal outcome for patients with cancer and COVID-19, with an overall mortality rate of 32.3%.[1] This analysis demonstrated a negative impact on COVID-19 outcome for patients with hematological malignancies or lung cancer when compared to patients with other solid tumors. However, the impact of anti-cancer therapies on the course of COVID-19, and risk factors affecting the COVID-19 outcome for patients with primary brain tumors in particular, have not yet been elucidated.[1,2] Therefore, the consequences of COVID-19 for patients with primary brain tumors, specifically those receiving oncological treatment, are unknown. Here, clinical characteristics and the outcome of COVID-19 in patients with primary brain tumors are presented.

Between March 27, 2020 and February 4, 2021, 30 patients with primary brain tumors were included in the DOCC registry. The clinical characteristics are shown in Table 1. In summary, the median age was 60 years, 53% of patients were male, and 77% of the patients had ≥1 comorbidity that was considered relevant for the course of COVID-19 (Table 1). Most patients (60%) were diagnosed with a glioblastoma and 5 patients were diagnosed with a prior or second malignancy: 2 patients with breast cancer (completed curative treatment), chronic lymphatic leukemia (active treatment with ibrutinib), prostate cancer (no active treatment), and melanoma (no active treatment). At COVID-19 diagnosis, most patients had received cancer treatment ≤90 days ago. Seven patients completed cancer treatment >6 months before COVID-19 diagnosis and 4 patients were still in the diagnostic phase. Active treatment consisted mostly of chemoradiation (32%) and radiotherapy (26%). In total, 63% of the patients had a severe course of COVID-19, defined as hospital admission (50%) and/or fatal outcome (13%). After hospital admission, 2 patients had to be discharged to a revalidation center while the other patients could be discharged home.

Overall, the reported mortality rates for patients with cancer and COVID-19 are estimated between 13% and 40.5%,[1,2] which is increased when compared with the general population.[3] For patients with primary brain tumors, fatality rates are similar as for patients with non-thoracic solid tumors.[1,2] However, most of the patients with primary brain tumors within the DOCC registry were admitted to the hospital, indicating a severe course of COVID-19. The latter could be partly explained by the design of this registry.[1] No major differences in clinical patient characteristics between patients with primary brain tumors with different outcomes of COVID-19 could be observed.

Due to the worldwide initiation of vaccination programs, it is expected that the incidence of severe COVID-19 will decrease. For patients with cancer, however, the efficacy of these vaccinations has not yet been clarified, as these patients were mostly excluded from vaccination trials.[4,5] Recent studies have shown decreased antibody responses to COVID-19 vaccination in patients with cancer, indicating a possible need for additional vaccination.[6] In addition, the efficacy of different vaccines against COVID-19 variants has not yet been determined. Therefore, specific risks for patients with cancer, in particular during systemic treatment, are still not clarified.

Within this registry, there were no indications of a negative impact of systemic anti-cancer therapies on the outcome of COVID-19. Based on these results, the application of oncological treatment appears to be relatively safe in patients with primary brain tumors and should not be postponed. Since a significant number of patients with primary brain tumors had a severe course of COVID-19, these results indicate the need for prioritizing vaccinations in patients with primary brain tumors.

Supplementary Material

Supplementary material is available at *Neuro-Oncology* online.

Funding

This study was supported by a grant from the Dutch Cancer Society, a nonprofit organization (Grant no: 2020-9021). The Dutch Cancer Society had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

Table 1. Clinical Patients' Characteristics

Variable	Mild Course	Severe Course (n = 19)		Total Group (n = 30)
	No Hospital Admission Indicated (n = 11)	Hospital Admission Indicated (n = 15)	Fatal (n = 4)	
Sex, n (%)				
Male	4 (25%)	9 (56%)	3 (19%)	16 (53%)
Female	7 (50%)	6 (43%)	1 (7%)	14 (47%)
Median age in years (interquartile range)	55 (38-67)	59 (55-65)	71 (52-77.25)	60 (50.75-70.25)
Risk factors, n (%)				
Smoking	5 (50%)	3 (30%)	2 (20%)	10 (33%)
Cardiovascular disease[a]	3 (33%)	4 (44%)	2 (22%)	9 (30%)
BMI[b] ≥30	4 (57%)	3 (43%)	0 (0%)	7 (23%)
COPD[c]	0 (0%)	1 (100%)	0 (0%)	1 (3%)
Diabetes mellitus	0 (0%)	1 (100%)	0 (0%)	1 (3%)
Prior/other malignancy	1 (20%)	2 (40%)	2 (40%)	5 (17%)
Use of dexamethasone at moment of COVID-19 diagnosis, n (%)				
No	7 (47%)	6 (40%)	2 (13%)	15 (50%)
Yes	4 (27%)	9 (60%)	2 (13%)	15 (50%)
Brain tumor type, n (%)				
Glioblastoma	6 (33%)	9 (50%)	3 (17%)	18 (60%)
Astrocytoma (WHO grade II/III)	4 (67%)	1 (17%)	1 (17%)	6 (20%)
Oligodendroglioma (WHO grade II/III)	1 (33%)	2 (67%)	0 (%)	3 (10%)
Ependymoma	0 (0%)	1 (100%)	0 (%)	1 (3%)
PCNSL	0 (0%)	2 (100%)	0 (%)	2 (7%)
Cancer treatment, n (%)				
Received treatment <90 days before COVID-19 diagnosis[d]	7 (37%)	9 (47%)	3 (16%)	19 (63%)[d]
Surgery	0 (0%)	0 (0%)	3 (100%)	3 (16%)[e]
Chemoradiation with temozolomide	5 (83%)	1 (17%)	0 (0%)	6 (32%)[e]
Radiotherapy	0 (0%)	5 (100%)	0 (0%)	5 (26%)[e]
Chemotherapy				
Temozolomide	0 (0%)	1 (100%)	0 (0%)	1 (5%)[e]
High-dose methotrexate	0 (0%)	2 (100%)	0 (0%)	2 (11%)[e]
PCV[f]	1 (100%)	0 (0%)	0 (0%)	1 (5%)[e]
Other[g]	1 (100%)	0 (0%)	0 (0%)	1 (5%)[e]

[a]Including patients with hypertension.
[b]Body mass index.
[c]Chronic obstructive pulmonary disease.
[d]For the patients who had active treatment (ie, oncological treatment <90 days before diagnosis of COVID-19), the last administered oncological treatment is shown.
[e]Percentage of patients who received active treatment, that is, any oncological treatment for primary brain tumor within 90 days before diagnosis of COVID-19.
[f]Procarbazine, lomustine, and vincristine regimen.
[g]Immunotherapy in form of nivolumab, as part of the trial.

Conflict of interest statement. J.W.B.G. reports the advisory board of Pierre Fabre, BMS, MSD, and Servier. A.-M.C.D. reports personal fees from Roche, personal fees from Eli Lily, personal fees from Boehringer Ingelheim, personal fees from Pfizer, personal fees from BMS, personal fees from Novartis, personal fees from Takeda, personal fees from Pharmamar, nonfinancial support from AbbVie, grants from BMS, grants from Amgen, outside the submitted work; A.A.M.V. reports the advisory board of BMS, MSD, Merck, Pfizer, Ipsen, Eisai, Pierre Fabre, Roche, Novartis, Sanofi, outside the submitted work. All other authors declare no competing interests.

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