Cox proportional hazards and logistic regression models, and Kaplan-Meier curves were plotted for subgroups.

**Results**

A total of 64 unique charts were reviewed. 18 patients (28%) of patients were treated with ICI as first-line therapy. 28 patients (44%) experienced immune-related adverse events with a total of 40 irAEs identified. Most irAE were grade I-II (78%), with 7 (17%) grade III and 1 (2.4%) grade IV irAEs. Most common sites were skin (29%), thyroid (20%) and gastrointestinal (15%). Patients with irAE had increased survival compared to those who did not have irAE (median survival not reached, vs 139 weeks, p=0.0004) (figure 1). This finding remained after excluding patients who had only experienced dermatologic irAE (median survival not reached in non-derm irAE subgroup, vs 144 weeks for dermatologic or no irAE, p=0.01) (figure 2). Patients treated with ICI as first line therapy had greater rates of developing irAE (72%) than those who had prior therapies (32%) (OR 5.4; p = 0.006). There was no association between histology type and rate of irAE.

**Conclusions**

The development of irAE’s in patients with mRCC treated with ICI is associated with longer survival. This study joins the growing body of evidence showing that presence of irAE’s is associated with increased treatment efficacy. Use of ICI as first-line therapy is associated with higher risk of irAE. Given growing use of ICI as first-line therapy, further study to predict onset and severity of irAE’s is required.

**Acknowledgements**

Hong Wang, PhD, for statistical support.

**Ethics Approval**

This study was approved by the University of Pittsburgh Institutional Review Board. Approval number STUDY19100386.

**REFERENCES**


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**IMMUNE-BRAIN**: A CASE SERIES OF COGNITIVE DYSFUNCTION/DECLINE IN CANCER PATIENTS ON IMMUNOTHERAPY

Sarah Gillett, Ximena Jordan-Bruno, Hibba Rehman, Alissa Thomas, Sarah Gillett*. University of Vermont Medical Center, Burlington, VT, USA

**Background**

Immunotherapy agents are now the standard of care for many types of malignancies and use of checkpoint inhibitor immunotherapy (IO) is widespread across oncology. Cognitive dysfunction/decline (CD) is a well-known side effect of conventional chemotherapy (i.e. 'chemo-brain'), but the neuro-cognitive impact of checkpoint inhibitor immunotherapy (IO) is not well described, despite the known potential for inflammatory neurotoxicities and encephalitis. Though high grade neurologic events are reported in <1% of patients receiving IO, less severe or possibly transient neurocognitive effects that do not lead to formal neuropsychological evaluation are probably under-reported. Combination of IO with other anti-cancer modalities like cytotoxic chemotherapy and radiation could theoretically compound neurotoxicity through neuroinflammation.

**Methods**

From January 2015-December 2018 at University of Vermont Medical Center, we retrospectively identified cancer patients who received at least one infusion of IO and had a concurrent diagnosis of CD on the problem list, medical history, or billing codes. We used the search terms: cognitive impairment, mild cognitive impairment, neurodegenerative cognitive impairment, memory change/memory deficit/memory difficulty/memory impairment, altered mental status, or encephalopathy to define cognitive impairment. Though high grade neurologic events are reported in <1% of patients receiving IO, less severe or possibly transient neurocognitive effects that do not lead to formal neuropsychological evaluation are probably under-reported. Combination of IO with other anti-cancer modalities like cytotoxic chemotherapy and radiation could theoretically compound neurotoxicity through neuroinflammation.

**Results**

We identified 55 patients and excluded 16 for CD before IO started, 23 with toxic/metabolic causes (including prerenal etiology, radiation, and death prior to CD evaluation). We identified 19 patients with CD (34% of treated patients). Patients were predominantly stage IV (89%) with breast (11%), lung (21%), renal (22%), colorectal (11%), lymphoma (11%), and melanoma (11%). Most patients had two or more co-morbidities. The most common adverse events were dermatologic (47%), fatigue (9%), and nausea (9%). Median survival was 7 months, and 2 patients received a trial of pembrolizumab for CD.

**Conclusions**

In a small case series of patients treated with immunotherapy, we identified a high rate of CD (34%) despite the majority of patients having two or more co-morbidities. Further study is needed to evaluate the neurocognitive effects of IO.
stroke, sepsis, medications, seizures), 4 for primary central nervous system malignancy, and 6 for CD related to new or worsening brain metastases. Six had CD possibly related to IO (table 1). Most had also received chemotherapy either concurrently or prior to starting IO, but two patients had only ever received IO cancer therapy. Four of the six had documented MMSE or neuropsychological testing. On careful chart review, no alternative diagnosis was identified as clearly causal for the worsening brain metastases. Six had CD possibly related to IO (table 1). Most had also received chemotherapy either concurrently in patients with squamous cell carcinoma than those with other lung cancer types. This analysis may allow clinicians to better identify patients more likely to develop irAE thyroid dysfunction based on lung cancer type.

Conclusions Thyroid irAEs occurred significantly less frequently in patients with squamous cell carcinoma than those with other lung cancer types. This analysis may allow clinicians to better identify patients more likely to develop irAE thyroid dysfunction based on lung cancer type.

http://dx.doi.org/10.1136/jitc-2020-SITC2020.0193

194 A MULTICENTER CHARACTERIZATION OF CHRONIC TOXICITIES FOLLOWING ADJUVANT ANTI-PD-1 THERAPY FOR HIGH RISK RESECTED MELANOMA

Background Anti-programmed death-1 (anti-PD-1) therapies have improved long-term survival across many advanced cancers. However, chronic immune-related adverse events (irAEs) are not well-defined. We sought to determine the incidence, time-course, spectrum, and predictors of chronic irAEs arising from adjuvant anti-PD-1.

Methods In this retrospective cohort, we analyzed patients from 8 academic medical centers with stage III-IV melanoma treated with anti-PD-1 in the adjuvant setting. Acute and chronic (persisting at least 3 months after therapy cessation) irAEs were characterized by type, time-course, management, and incidence.

Results Among 387 patients, most were male (60.7%) with a median age of 63 years, had cutaneous primaries (85.8%), and incidence.

Conclusions Patients receiving IO cancer therapy do report CD, which has not been broadly described. Though our data is corollary, it opens the question as to whether prospective pre- and post-treatment cognitive monitoring may identify more patients with neurocognitive symptoms related to immuno-therapy. Future research is needed to report incidence of potential IO-related CD and to develop preventative or therapeutic strategies.

http://dx.doi.org/10.1136/jitc-2020-SITC2020.0192

193 DIFFERENCES IN THYROID IMMUNE-RELATED ADVERSE EVENTS BETWEEN LUNG CANCER TYPES, A RETROSPECTIVE ANALYSIS

Background Immune modulation of the PD-1/PD-L1 pathway is a promising treatment of various malignancies however, alteration of the pathway is known to cause many immune related adverse events (irAEs) including thyroid dysfunction. Whether the frequency of thyroid irAEs differ between lung cancer types has not yet been studied.

Methods A total of three hundred twenty-nine lung cancer patients treated with immunotherapy at East Carolina University between April 2014 and July 2019 were included in a retrospective cohort analysis. Baseline TSH and TSH at each treatment cycle were recorded along with the type of lung cancer, specific agent used, timing of thyroid dysfunction and need for levothyroxine replacement. The frequency of thyroid irAEs as defined by TSH < 0.4 or > 4.0 and its relationship with lung cancer types were analyzed using chi square tests and logistic regression.

Results Of the three hundred twenty-nine patients; 54.4% had adenocarcinoma, 31.6% had squamous cell carcinoma, 11.3% had small cell carcinoma and 2.7% had poorly differentiated lung cancer. Overall, 135 patients (41.0%) developed thyroid irAEs (table 1). Pearson’s chi square test was used to compare the frequencies of thyroid irAEs for each type of lung cancer across all other lung cancer types. Patients with squamous cell carcinoma developed significantly less thyroid irAEs (32.7%), compared to all other lung cancers (44.9%), X2 (1, N = 329) = 4.4, p = 0.037. Conversely, patients with lung cancer types other than squamous cell carcinoma were more likely to develop thyroid irAEs, OR = 1.68 (95% CI: 1.03 – 2.73).

Conclusions Thyroid irAEs occurred significantly less frequently in patients with squamous cell carcinoma than those with other lung cancer types. This analysis may allow clinicians to better identify patients more likely to develop irAE thyroid dysfunction based on lung cancer type.

http://dx.doi.org/10.1136/jitc-2020-SITC2020.0193

Abstract 192 Table 1

<table>
<thead>
<tr>
<th>Thyroid Dysfunction</th>
<th>Frequency</th>
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<tbody>
<tr>
<td>Thyroiditis/hypothyroid</td>
<td>16.3%</td>
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<tr>
<td>Arthralgias</td>
<td>10.6%</td>
</tr>
<tr>
<td>Colitis/diarrhea</td>
<td>9.8%</td>
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</table>

Abstract 193 Table 1

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<tr>
<th>Type of Cancer (N=329)</th>
<th>Patients With Each Cancer Type</th>
<th>Patients With Thyroid Dysfunction Within Each Cancer Type (N=329)</th>
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<tbody>
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<td>104 (31.6%)</td>
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