Frequency of and testing patterns for microsatellite instability-high and mismatch repair-deficient among solid tumors in a US community oncology setting

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Background/objectives

- Following the 2017 FDA approval of pembrolizumab for microsatellite instability-high (MSI-H)/mismatch repair-deficient (dMMR) tumors, MSI-H/dMMR has become an actionable biomarker in the treatment of several tumor types[1]
- However, there is a paucity of data on the frequency of MSI-H/dMMR across the different stage IV/metastatic tumor types
- This study assessed the frequency of and testing for MSI-H/dMMR across various solid tumors in a real-world community oncology setting in the US

Methods

Study design

- This was a retrospective observational study using data from iKnowMed™, the electronic health records database of The US Oncology Network
- The US Oncology Network includes nearly 1,400 providers in community oncology practices across 25 states and treats an average of 1.2 million patients per year[2]

Patient population

- Patients ≥18 years of age diagnosed with select stage IV solid tumors (listed in **Table 1**) during the study identification period (01 Jan 2010 to 29 Feb 2020)
- Patients had to have received care in The US Oncology Network during the study period, with ≥2 visits
- Patients were excluded if enrolled in clinical trials and if receiving treatment for another primary cancer not mentioned in the inclusion criteria during the study observation period (same as the study identification period)

Data abstraction and analysis

- Demographic information and stage at diagnosis were abstracted from structured fields of electronic health records. Descriptive analysis of testing records and results was performed

Results

- A total of 8,899 patients with stage IV solid tumors were reported as having been tested for MSI or MMR across 14 tumor types (**Figure 1**, **Table 1**). Among these, 1,338 patients (15%; 95% CI, 14.3, 15.8) tested positive for MSI-H/dMMR
- Median (range) age of patients with MSI-H/dMMR tumors was 65.8 (21.8-90+) years, with 53.3% female and 71.9% white
- The proportion with MSI-H and/or dMMR was 15.0% for all tumor types and ranged from 3.2% for soft tissue sarcomas to 28.9% for endometrial cancers (**Figure 2**)
- Overall, 7,694 and 5,536 patients were tested for MSI-H and dMMR, respectively, with 8.5% and 16.6% documented as testing positive for MSI-H and dMMR
- The proportion of patients tested for MSI-H or dMMR increased over time: 4.1% (2010-2016) vs 17.7% (2017-2020), respectively (**Figure 3**)

Figure 1. Study attrition

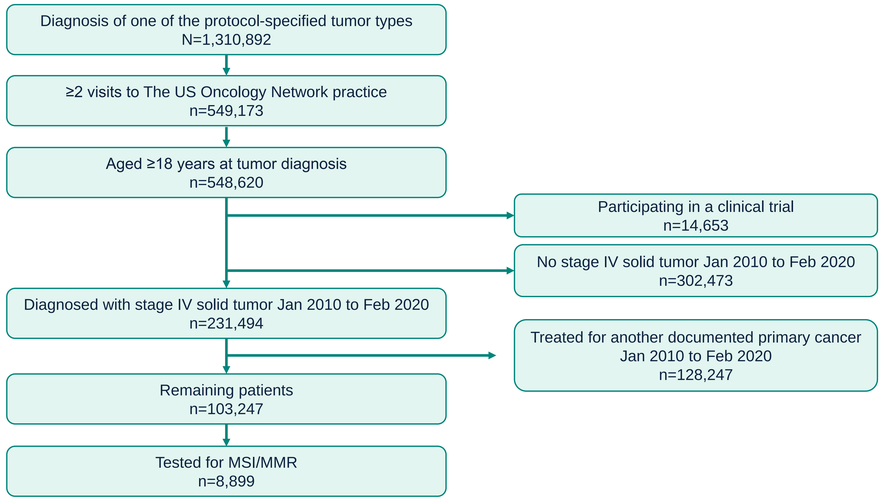
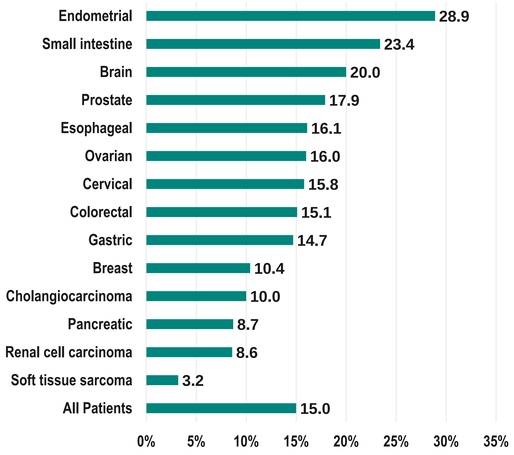


Table 1. MSI-H/dMMR testing rates across solid tumor types (entire study period)

Type of cancer	Total number of patients	Number (proportion[a]) of patients tested for MSI or MMR
Brain	2,354	5 (0.21%)
Breast	22,828	491 (2.2%)
Cervical	1,468	95 (6.5%)
Cholangio-carcinoma	2,750	90 (3.3%)
Colorectal	19,260	5,777 (30%)
Endometrial	4,643	266 (5.7%)
Esophageal	4,372	410 (9.4%)
Gastric	2,594	251 (9.7%)
Ovarian	8,284	530 (6.4%)
Pancreatic	10,050	492 (4.9%)
Prostate	15,338	379 (2.5%)
Renal cell carcinoma	6,009	35 (0.6%)
Small intestine	560	47 (8.4%)
Soft tissue sarcoma	2,737	31 (1.1%)
All patients	103,247	8,899 (8.6%)

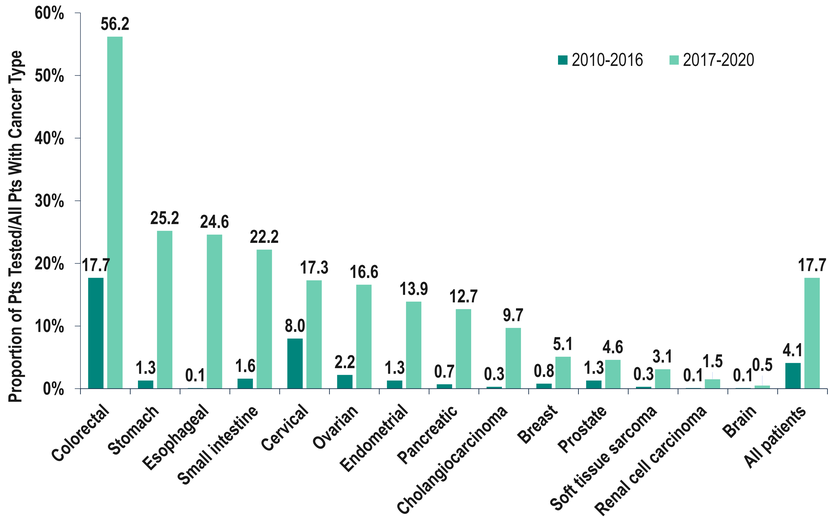
[a]Proportion of pts = Number of pts tested for MSI-H or dMMR / Total number of pts that had each tumor type *100.

Figure 2. Proportion[a] of patients testing positive for MSI-H/dMMR across solid tumor types (entire study period)



[a]Proportion of pts = Number of pts with MSI-H or dMMR / Total number of pts tested for MSI or MMR within each tumor type *100.

Figure 3. Temporal testing rates for MSI/MMR across solid tumor types



Conclusions

- Molecular frequency of MSI-H/dMMR varied across tumor types assessed, with the highest proportion found among patients with endometrial cancer
- Increases in MSI or MMR testing signify the importance of known MSI/MMR status for patient treatment and/or management among community oncologists. This shift was likely prompted by the 2017 approval of pembrolizumab for MSI-H/dMMR solid tumors[1]; however, testing rates are still less than optimal
- Data sources and testing practices should be considered when interpreting the results
- Some testing results may not have been captured in structured data

References

1. KEYTRUDA (pembrolizumab) Highlights of Prescribing Information. Updated 2021.
2. The US Oncology Network. 2022. https://www.usoncology.com/our-company

Disclosures

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