Treatment Patterns, Clinical Outcome, Healthcare Resource Utilization, and Healthcare Costs Among Patients With Metastatic Gastric/Gastroesophageal Junction Cancer in Medicare Beneficiaries

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BACKGROUND

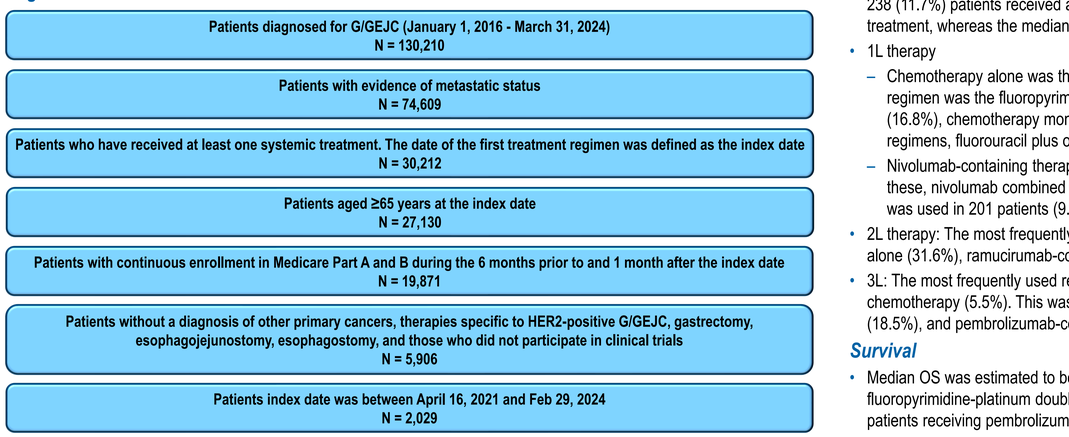
- Gastric cancer, including gastroesophageal junction cancer (G/GEJC), is the fifth most commonly diagnosed cancer worldwide, with an estimated 968,784 new cases and 660,175 deaths in 2022.[1,2]
- For patients with HER2-negative advanced G/GEJC, standard first-line (1L) treatment with platinum-fluoropyrimidine doublet chemotherapy provides a median survival of approximately one year.[3-5] The addition of nivolumab, approved in the U.S. on April 16, 2021, has demonstrated improved survival; however, its efficacy is primarily observed in patients with a PD-L1 combined positive score (CPS) of ≥5.[6] More recently, the survival benefits demonstrated in pivotal studies have led to the approval of pembrolizumab, zolbetuximab, and tislelizumab.
- Previous studies, using data from before the availability of immune checkpoint inhibitors, estimated that the average total cost for advanced G/GEJC patients was $26,904 to $72,778 per patient, underscoring a significant economic burden.[7-9]
- This study analyzes real-world patient characteristics, treatment patterns, overall survival (OS), healthcare resource utilization (HCRU), and costs among Medicare beneficiaries with metastatic G/GEJC (mG/GEJC), utilizing recent data since April 16, 2021. Thus, these findings reflect real-world outcomes following the introduction of immune checkpoint inhibitors.

METHODS

- A retrospective observational cohort study was conducted using the 100% Medicare Fee-for-Service database. The study utilized data spanning from January 1, 2016 to March 31, 2024. This study included patients who initiated 1L systemic anticancer therapy between April 16, 2021 and February 29, 2024.
- Inclusion Criteria
  - Patients (age ≥65 years) with at least one inpatient (IP) or two outpatient (OP) claims 30 days apart with a diagnosis code for G/GEJC
  - Patients with at least one IP or one OP claim with diagnosis code for secondary malignant neoplasm 30 days prior, or any time after the first observed diagnosis for G/GEJC, as a proxy for a mG/GEJC diagnosis
  - Patients who received at least one non-HER2-targeted systemic anticancer therapy within 60 days prior to and 90 days after their mG/GEJC diagnosis. The date of the first observed systemic anticancer therapy was identified as the initiation of 1L therapy, and the index date
  - Patients who were continuously enrolled for at least 6 months before and 1 month after the index date
- Exclusion Criteria
  - Patients who received HER2-targeted therapy
  - Patients with other primary cancers (≥1 diagnosis of other primary cancers excluding non-melanoma skin cancer during any time prior to the index date)
  - Patients who underwent gastrectomy, esophagogastrectomy, or esophagostomy within 6 months before or after the index date
  - Patients who participated in a clinical trial
- Data analysis
  - Patient characteristics were assessed during the 6-month baseline period prior to the index date.
  - Outcomes were assessed during the follow-up period between the index date and the date of death, end of continuous enrollment, or study end date (March 31, 2024), whichever occurred first.
  - OS, defined as the time from the 1L initiation to death, loss of follow-up, or the study end date, whichever came first, was analyzed by Kaplan-Meier methods.
  - All analyses were descriptive.

RESULTS

Figure 1. Patient selection flow chart



Abbreviations: HER2, human epidermal growth factor receptor 2; G/GEJC: gastric or gastroesophageal junction cancer.

RESULTS (Continued)

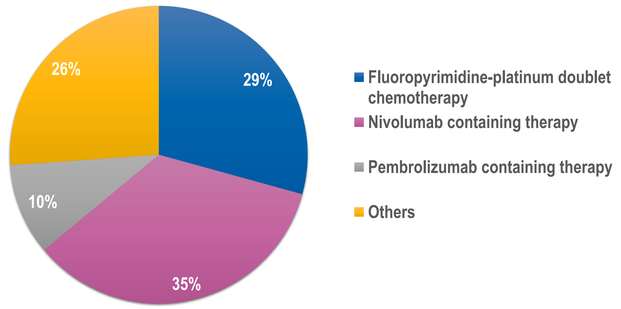
Table 1. Baseline characteristics

Characteristic, n (%)	N = 2,029
Age (years), mean (SD)	74.9 (6.3)
Male gender	1,453 (71.6)
Race and ethnicity	
Non-Hispanic White	1,630 (80.3)
Black	103 (5.1)
Asian	106 (5.2)
Hispanic	101 (5.0)
Other or unknown	89 (4.4)
Geographic region	
South	696 (34.3)
Midwest	462 (22.8)
West	441 (21.7)
Northeast	<430 (21.2)
Other[1] or unknown	<11 (-)
Coverage type on index date	
Part A and B with Part D	1,513 (74.6)
Part A and B without Part D	516 (25.4)
Metastasis site[2] (not mutually exclusive)	
Lymph nodes	785 (38.7)
Lymph nodes only	600 (29.6)
Liver	545 (26.9)
Peritoneum	386 (19.0)
NCICI, mean (SD)	0.5 (0.6)
Top 3 NCI comorbidities	
Diabetes mellitus	545 (26.9)
Chronic obstructive pulmonary disease	365 (18.0)
Peripheral vascular disease	309 (15.2)

- This study included 2,029 patients with a mean age of 75 years. Most patients were male (71.6%), and non-Hispanic white (80.3%). A higher proportion of patients lived in the south geographically (34.3%). The most common metastasis sites were lymph nodes (38.7%), lymph nodes only (29.6%), and liver (26.9%). The most common comorbidities were diabetes mellitus (26.9%), chronic obstructive pulmonary disease (18.0%), and peripheral vascular disease (15.2%).

Note: [1] Other geographic regions included Puerto Rico, Virgin Islands, Canada, Europe, Mexico, Philippines, South America, Guam and American Samoa. [2] The table shows metastatic sites with at least 10% occurrence. Abbreviations: N: number of patients, NCI: National Cancer Institute; NCICI: National Cancer Institute comorbidity index; SD: standard deviation.

Figure 2. Treatment regimens in 1L



Note: Others include other chemotherapy and off-label regimens.

Treatment Regimens

- Among 2,029 patients who received a 1L therapy, 776 (38.2%) patients received a second-line therapy (2L), and 238 (11.7%) patients received a third-line therapy (3L). The median duration was 3.0 months for both 1L and 2L treatment, whereas the median duration was 4.0 months for 3L therapy.
- 1L therapy
  - Chemotherapy alone was the most common 1L treatment, received by 55.0% of patients. The most frequently used regimen was the fluoropyrimidine-platinum doublet chemotherapy (29.3%), followed by other chemotherapy doublets (16.8%), chemotherapy monotherapy (4.6%), and chemotherapy triplets (4.3%). Among chemotherapy-alone regimens, fluorouracil plus oxaliplatin (26.9%) and carboplatin plus paclitaxel (15.2%) were the most frequently used.
  - Nivolumab-containing therapy was the second most common 1L therapy, received by 34.7% of patients. Among these, nivolumab combined with fluorouracil and oxaliplatin was the predominant regimen (86.0%). Pembrolizumab was used in 201 patients (9.9%), reflecting its recent approval on November 16, 2023.
- 2L therapy: The most frequently used regimen was nivolumab-containing therapy (36.3%), followed by chemotherapy alone (31.6%), ramucirumab-containing therapy (19.5%), and pembrolizumab-containing therapy (11.9%).
- 3L: The most frequently used regimen was chemotherapy alone (34.9%), including fluoropyrimidine-platinum doublet chemotherapy (5.5%). This was followed by ramucirumab-containing therapy (34.0%), nivolumab-containing therapy (18.5%), and pembrolizumab-containing chemotherapy (11.3%).

Survival

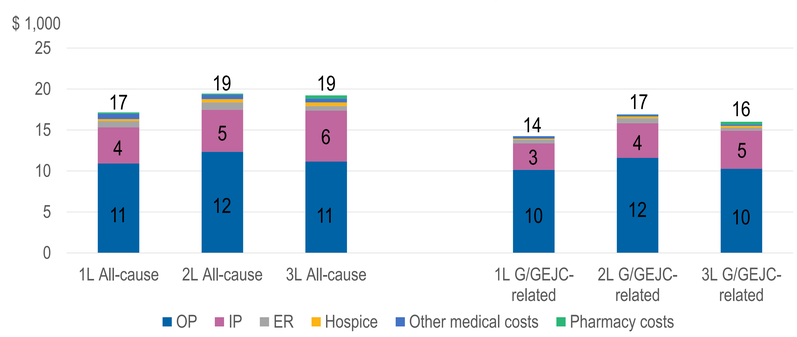
- Median OS was estimated to be 10.8 months for all patients. Median OS was 9.8 months for patients receiving fluoropyrimidine-platinum doublet, 11.2 months for those receiving nivolumab-containing regimens, and 13.7 months for patients receiving pembrolizumab-containing treatments.

Table 2. All-cause and mG/GEJC-related HCRU in 1L, PPPM

HCRU, PPPM, mean (SD)	All-cause HCRU	mG/GEJC-related HCRU
IP[1]		
Number of IP admissions	0.3 (0.5)	0.2 (0.4)
Total IP days	1.7 (3.3)	1.3 (3.0)
OP		
Number of OP visits	3.7 (1.7)	2.7 (1.5)
ER		
Number of ER visits	0.3 (0.5)	0.1 (0.4)
Hospice		
Number of hospice episodes	0.1 (0.2)	0.0 (0.1)
Total hospice days	0.8 (3.0)	0.4 (2.2)
Other visits[2]		
Number of other visits	1.3 (1.6)	0.3 (0.6)

Notes: [1] ICU visits were included in the IP visits. [2] Other visits include home health services and skilled nursing facilities.
Abbreviations: 1L: first-line; ER: emergency room; HCRU: healthcare resource utilization; ICU: intensive care unit; IP: inpatient; LOT: line of therapy; mG/GEJC: metastatic gastric or gastroesophageal junction cancer; OP: outpatient; PPPM: per-patient-per-month; SD: standard deviation.

Figure 3. All-cause and mG/GEJC-related healthcare costs by LOT, PPPM



Note: [1] Costs were inflated to 2024 USD using the medical component of Consumer Price Index. [2] ICU costs were included in the IP costs. [3] Other costs include home health services and skilled nursing facilities costs. [4] Pharmacy costs were identified through Part D claims only which were available until 2022 Q4. Data may not be complete for some patients with follow-up beyond 2022 Q4.
Abbreviations: 1L: first-line; 2L: second-line; 3L: third-line; ER: emergency room; ICU: Intensive care unit; IP: inpatient; LOT: line of therapy; mG/GEJC: metastatic gastric or gastroesophageal junction cancer; OP: outpatient; PPPM: per-patient-per-month; SD: standard deviation.

HCRU and costs

- Outpatient (OP) visits were the most frequently utilized service across all lines of therapy (LOTs) for both all-cause and G/GEJC-related HCRU. Usage was similar in 1L and 2L (3.7 and 3.8 all-cause visits, 2.7 and 2.6 G/GEJC-related visits per patient per month [PPPM], respectively) but lower in 3L (3.6 all-cause visits, 2.4 G/GEJC-related visits PPPM). Hospice use was minimal across all LOTs, with the lowest utilization observed in 1L and 2L.
- The all-cause PPPM costs were $17,191 (1L), $19,572 (2L), and $19,373 (3L). The total PPPM G/GEJC-related costs were $14,334 (1L), $17,072 (2L), and $16,070 (3L).
- Outpatient care accounted for the highest proportion of all-cause and G/GEJC-related costs, followed by inpatient stays as the second highest cost category (Figure 3).

CONCLUSIONS

- Despite the approval of nivolumab, chemotherapy alone remained the most commonly used 1L regimen, while nivolumab-containing therapy was the most frequently used regimen in 2L.
- Healthcare costs for patients with mG/GEJC were relatively high compared to reported costs for other advanced solid tumors in elderly populations. For context, PPPM costs during 1L treatment have been estimated at approximately $9,400 for lung cancer and $12,360 for prostate cancer.[10,11]
- The monthly per-patient healthcare costs during 1L treatment were generally consistent with previous reported estimates, ranging from $16,242 in a SEER-Medicare analysis (2000-2009) to $16,977 based on IQVIA Adjudicated Closed Claims database analysis (2016-2019).[7,12]
- This study is limited by its short follow-up period. Additionally, the use of data immediately following the approval of nivolumab may not accurately represent long-term patterns, as the adoption of new medications typically occurs gradually over time.
- Despite the addition of nivolumab as an option for 1L treatment, mG/GEJC remains associated with short OS, treatment duration, and high economic burden, suggesting significant remaining unmet need.

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