

Introduction

Although incidence of gastric adenocarcinoma (GAC) has been declining overall, incidence rate of esophagogastric junction, or cardia, cancer is rising. However, this change in GAC anatomical distribution has not been explored through the lens of gender, race, and ethnicity in recent years.

Methods

All persons with GAC recorded in the SEER database from 2000-2019 were characterized according to gender, race (White, Black, American Indian/Alaska Native or AI, and Asian/Pacific Islander or API) and ethnicity (Hispanic, non-Hispanic or NH). Statistical significance was calculated with one-way ANOVA.

Results

-Data from 17 cancer registries in the US reveal incidence of 100,014 cases of GAC, 63% of which occurred in men. As known previously, the cardia was the site of most frequent occurrence in men (39%).

-The antrum was the site of most frequent occurrence in women (24%).
-The antrum was the predominant site of GAC occurrence in Hispanic men (20%), Hispanic women (24%), and non-Hispanic women (24%), as opposed to non-Hispanic men, for which the site was the cardia (43%).

-Non-Hispanic White (28%) women were also most likely to have GAC in cardia, whereas non-Hispanic women of other races, as well as Hispanic women overall, regardless of race, were all most likely to have GAC in the antrum. However, analysis of anatomical distribution of GAC among racial groups within both non-Hispanic and Hispanic women revealed statistically significant differences ($p < 0.001$ for both). This difference disappears when comparing the distribution of GAC in Hispanic vs non-Hispanic women overall ($p = 0.208$).

-In non-Hispanic men, racially AI men (24%) as well as White men (55%) were most likely to have GAC in the cardia, while Black (26%) and API (29%) men were most likely to have GAC in the antrum.

-In Hispanic men, racially White (20%) and Black (24%) men were most likely to have GAC in the antrum, while AI (27%) and API (27%) men were most likely to have GAC in the cardia.

Discussion

-Multiple factors most likely contribute to why incidence of GAC occurs at different frequencies in different anatomical locations among patients of different genders, ethnicity, and races.

-Some factors include changing demographics of immigrants, the obesity epidemic, tobacco use and distribution of tobacco cessation resources, etc.

-The frequency of GAC in the antrum of women suggests that there is still work to be done to reduce factors that predispose them to antral GAC, such as h. pylori eradication and treatment.

-Physicians also should be aware of the frequency of GAC in the cardia that are occurring in their non-White male populations as well.

KEY FINDINGS

-As known previously, since the year 2000, the **cardia** is the anatomical location where gastric adenocarcinoma is most frequently diagnosed in **Non-Hispanic men**.

-The **antrum** is the location where gastric adenocarcinoma is most frequently diagnosed in **Hispanic men, Non-Hispanic women, and Hispanic women**.

-Gastric adenocarcinoma is diagnosed more frequently in the **cardia in Non-Hispanic White women**, but occurs more frequently in the **antrum or in sites not clearly identified in women of different ethnicities and races**.

-In addition to occurring most frequently in Non-Hispanic White men, gastric adenocarcinoma is diagnosed more frequently in the **cardia** than in other anatomical regions of the stomach in **American Indian/Alaskan Native men, regardless of ethnicity, and Hispanic men who identify as Asian/Pacific Islander**.

Data

	Both	Both	Male	Male	Female	Female
FREQUENCY	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic	Non-Hispanic	Hispanic
C16.0-Cardia, NOS	27,973	3,052	22,144	2,172	5,829	880
C16.1-Fundus of stomach	2,920	780	1,754	471	1,166	309
C16.2-Body of stomach	6,930	2,368	3,742	1,305	3,188	1,063
C16.3-Gastric antrum	15,169	4,141	8,280	2,249	6,889	1,892
C16.4-Pylorus	2,219	719	1,273	435	946	284
C16.5-Lesser curvature of stomach NOS	5,955	1,741	3,596	1,024	2,359	717
C16.6-Greater curvature of stomach NOS	2,751	805	1,560	480	1,191	325
C16.8-Overlapping lesion of stomach	5,620	1,960	3,198	1,122	2,422	838
C16.9-Stomach, NOS	11,557	3,354	6,546	1,804	5,011	1,550
Total	81,094	18,920	52,093	11,062	29,001	7858
Predominant			42.51%	20.33%	23.75%	24.08%

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NON-HISPANIC Female	White	%	Black	%	American Indian/Alaskan Native	%	Asian or Pacific Islander	%	Unknown	%
C16.0-Cardia, NOS	4,811	28%	479	10%	51	15%	475	7%	13	14%
C16.1-Fundus of stomach	786	5%	176	4%	18	5%	183	3%	3	3%
C16.2-Body of stomach	1,762	10%	590	12%	26	8%	801	13%	9	10%
C16.3-Gastric antrum	3,341	19%	1,391	29%	69	21%	2,065	32%	23	26%
C16.4-Pylorus	497	3%	235	5%	15	4%	197	3%	2	2%
C16.5-Lesser curvature of stomach NOS	1,097	6%	440	9%	44	13%	774	12%	4	4%
C16.6-Greater curvature of stomach NOS	670	4%	186	4%	17	5%	315	5%	3	3%
C16.8-Overlapping lesion of stomach	1,374	8%	401	8%	32	10%	611	10%	4	4%
C16.9-Stomach, NOS	3,013	17%	942	19%	64	19%	963	15%	29	32%
SUM	17,351	100%	4,840	100%	336	100%	6,384	100%	90	100%

NON-HISPANIC Male	White	%	Black	%	American Indian/Alaskan Native	%	Asian or Pacific Islander	%	Unknown	%
C16.0-Cardia, NOS	19,444	55%	1,104	15%	131	24%	1,423	16%	42	33%
C16.1-Fundus of stomach	1,252	4%	242	3%	20	4%	233	3%	7	6%
C16.2-Body of stomach	2,043	6%	720	10%	29	5%	934	11%	16	13%
C16.3-Gastric antrum	3,800	11%	1,883	26%	76	14%	2,503	29%	18	14%
C16.4-Pylorus	602	2%	304	4%	35	6%	329	4%	3	2%
C16.5-Lesser curvature of stomach NOS	1,705	5%	760	11%	85	15%	1,040	12%	6	5%
C16.6-Greater curvature of stomach NOS	874	2%	295	4%	32	6%	358	4%	1	1%
C16.8-Overlapping lesion of stomach	1,822	5%	635	9%	44	8%	693	8%	4	3%
C16.9-Stomach, NOS	4,038	11%	1,235	17%	104	19%	1,139	13%	30	24%
SUM	35,580	100%	7,178	100%	556	100%	8,652	100%	127	100%

HISPANIC Female	White	%	Black	%	American Indian/Alaskan Native	%	Asian or Pacific Islander	%	Unknown	%
C16.0-Cardia, NOS	846	11%	11	13%	3	19%	9	13%	11	12%
C16.1-Fundus of stomach	300	4%	5	6%	0	0%	2	3%	2	2%
C16.2-Body of stomach	1,031	14%	8	9%	6	38%	8	11%	10	11%
C16.3-Gastric antrum	1,834	24%	23	26%	0	0%	15	21%	20	21%
C16.4-Pylorus	272	4%	3	3%	1	6%	5	7%	3	3%
C16.5-Lesser curvature of stomach NOS	687	9%	11	13%	1	6%	7	10%	11	12%
C16.6-Greater curvature of stomach NOS	310	4%	2	2%	0	0%	5	7%	8	8%
C16.8-Overlapping lesion of stomach	819	11%	8	9%	0	0%	7	10%	4	4%
C16.9-Stomach, NOS	1,491	20%	16	18%	5	31%	12	17%	26	27%
SUM	7,590	100%	87	100%	16	100%	70	100%	95	100%

HISPANIC Male	White	%	Black	%	American Indian/Alaskan Native	%	Asian or Pacific Islander	%	Unknown	%
C16.0-Cardia, NOS	2,099	20%	21	20%	11	27%	21	27%	20	18%
C16.1-Fundus of stomach	462	4%	6	6%	0	0%	1	1%	2	2%
C16.2-Body of stomach	1,260	12%	9	9%	7	17%	12	15%	17	16%
C16.3-Gastric antrum	2,187	20%	25	24%	6	15%	11	14%	20	18%
C16.4-Pylorus	421	4%	2	2%	3	7%	5	6%	4	4%
C16.5-Lesser curvature of stomach NOS	994	9%	3	3%	3	7%	8	10%	16	15%
C16.6-Greater curvature of stomach NOS	468	4%	4	4%	2	5%	2	3%	4	4%
C16.8-Overlapping lesion of stomach	1,099	10%	12	11%	3	7%	2	3%	6	6%
C16.9-Stomach, NOS	1,738	16%	23	22%	6	15%	17	22%	20	18%
SUM	10,728	100%	105	100%	41	100%	79	100%	109	100%