

Adolescent and Young Adult Cancer

Adolescent and Young Adults with Gastric Cancer (AYA-GC)—The Dilemma of an Under-Represented Group: A Multi-Institutional Analysis from the Indian Subcontinent

Soumya Surath Panda¹ Swati Sucharita Mohanty¹ Antara Sanyal¹ Prasanth Ganesan²
 Smita Kayal² Krishnakumar Rathnam³ S. V. Saju³ Sunu Cyriac⁴ P. Unnikrishnan⁴
 Amit Sehrawat⁵ Deepak Sundriyal⁵ Ashwin Oommen Philips⁶ Deepak Jain⁷
 Sumit Subhadarshi Mohanty⁸ Sunil Kumar Agrawal⁹ Lalatendu Moharana¹
 Satyaprakash Ray Choudhury⁸ Biswajit Dubashi²

¹Department of Medical Oncology, Institute of Medical Sciences and Sum Hospital, Siksha 'O' Anusandhan Deemed to be University, Bhubaneswar, Odisha, India

²Department of Medical Oncology, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry, India

³Department of Medical Oncology, Meenakshi Mission Medical College and Research Center, Madurai, Tamil Nadu, India

⁴Department of Medical Oncology, Amala Institute of Medical Sciences, Thrissur, Kerala, India

⁵Department of Medical Oncology, All India Institute of Medical Sciences, Rishikesh, Uttarakhand, India

⁶Department of Medical Oncology, Christian Medical College & Hospital, Ludhiana, Punjab, India

Address for correspondence Soumya Surath Panda, MD, DM, Department of Medical Oncology, Institute of Medical Sciences and Sum Hospital, Siksha 'O' Anusandhan Deemed to be University, Bhubaneswar- 751003, Odisha, India (e-mail: soumyasurathpanda@soa.ac.in).

⁸Department of Gastrosurgery, Institute of Medical Sciences and Sum Hospital, Siksha 'O' Anusandhan Deemed to be University, Bhubaneswar, Odisha, India

⁹Department of Surgical Oncology, Institute of Medical Sciences and Sum Hospital, Siksha 'O' Anusandhan University, Bhubaneswar, Odisha, India

⁷Department of Surgery, Christian Medical College & Hospital, Ludhiana, Punjab, India

South Asian J Cancer 2024;13(2):142–145.



Soumya Surath Panda

Keywords

- ▶ adolescent and young adults
- ▶ gastric cancer
- ▶ multi-institutional
- ▶ incidence
- ▶ prevalence
- ▶ Network of Oncology Clinical Trials in India

Gastric cancer (GC) is often ignored at a young age, which frequently leads to tragic consequences. The worldwide incidence of GC is increasing at a young age. In view of the limited Indian publication, we sought to characterize clinicopathological parameters and risk factors in the adolescents and young adults (AYA) population. Retrospective data from six centers (which are part of the Network of Oncology Clinical Trials in India) from 2015 to 2020 were collected from patient (18–39 years of age) records. This study was approved by the institutional ethical committee of individual centers. All statistical analyses were performed using Microsoft Excel and SPSS (Version 20). Data interpretation along with the analysis of obtained results was carried out using the following tests: Qualitative data was expressed in terms of frequency/percentage. One-hundred fifty-two AYA GC patients were enrolled. The 31 to 39 years age group was most affected in which 76.3% were females. The majority of patients were nonalcoholic (93.4%), nonsmokers (98.0%), and without a family history (98.0%). The most common (MC) presenting symptom was abdominal pain (67.1%). MC site was antrum (48%). Among esophagogastric junction cancers, the majority were type I and II Siewert

DOI <https://doi.org/10.1055/s-0043-1771275> ISSN 2278-330X

How to cite this article: Panda SS, Mohanty SS, Sanyal A et al. Adolescent and Young Adults with Gastric Cancer (AYA-GC)—The Dilemma of an Under-Represented Group: A Multi-Institutional Analysis from the Indian Subcontinent. *South Asian J Cancer* 2024;13(2):142–145.

© 2023. MedIntel Services Pvt Ltd. All rights reserved.

This is an open access article published by Thieme under the terms of the Creative Commons Attribution-NonDerivative-NonCommercial-License, permitting copying and reproduction so long as the original work is given appropriate credit. Contents may not be used for commercial purposes, or adapted, remixed, transformed or built upon. (<https://creativecommons.org/licenses/by-nc-nd/4.0/>)

Thieme Medical and Scientific Publishers Pvt. Ltd., A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

classifications (77% [20/26] patients in cardia), MC histology—signet ring cell (67.1%) followed by diffuse-type (65.1%). Most were poorly differentiated (65.1%) and were diagnosed at an advanced stage (III & IV= 54.6%). This is one of our country's first large multicenter studies on GC in the AYA population. There was a higher female prevalence, aggressive tumor behavior and the majority of patients were diagnosed at a more advanced stage. The majority were nonsmokers with a negative family history. Awareness among general people, researchers, clinicians, and policymakers must be improved to better the loss of life years in the younger population.

Introduction

Ranked as the leading cause of mortality globally,¹ gastric cancer (GC) was previously deemed to be a malignancy limited to the elderly age group, occurring most commonly at an average age of 68 years in the United States with more than 95% of these patients aged 40 years² and above. Henceforth, majority of the study or clinical trials tend to focus on this group of patients with evidence-based approaches and management guidelines for them. It is imperative to note that the adolescent and young adults (AYA) population globally delivers to a nation's economy and is required to contribute to various healthcare-related taxation laws yet are devoid in terms of definite approach and tailored treatment of various malignancies such as GC due to its low incidence in this age group. The patients in the AYA-GC tend to present at an advanced stage carrying a poorer prognosis as compared to the elderly population with lowered life expectancy.^{3,4} In a recent study based on the Chinese population with GC, the prime focus was on the tendency of GC and its dissimilarity to the GC in the geriatric population.⁵ It is an unmet need of the hour for a country like ours to identify the AYA-GC group that is often under-represented due to low awareness not only among patients and respondents but also the healthcare practitioners, leading to a delayed time to diagnosis and treatment thereby compromising the outcome and life expectancy of the patient and affecting disease affected life years. There are few papers from our country that highlight the low survival and advanced stage of presentation in this age group.^{6,7}

Methods

A review of the literature was performed by downloading research articles from PubMed Central, with keywords such as young GC characteristics, GC in adolescents, and GC in young adults. Retrospective data of 152 patients (18–39 years) admitted between the years 2015 to 2020 were collected from multiple institutes across India that are part of the Network of Oncology Clinical trials India (NOCI): Registry of Cancers (www.noci-india.com). This study was approved by the institutional review board of all individual centers and the patient's consent was taken. All these patients were followed up by dint of outpatient department sojourns or telephonically. Data on clinical features, laboratory, and pathology were collected from the medical records of each

patient available in the medical archives of six hospitals. The data was anonymized and entered into a common database. All statistical analyses were performed using Microsoft Excel and SPSS (Version 20). Data interpretation along with the analysis of obtained results was carried out using the following tests: Qualitative Data was expressed in terms of frequency/percentage.

Results

Baseline characteristics have been summarized in [Table 1](#). A total of 152 patients' data was available for analysis; it was observed that the majority of the patients were affected in the age group of 31 to 39 years and of these (median age: 35 years), 116 (76.3%) were female. In terms of substance abuse history, it was observed that of the 152 patients, a history of alcohol consumption was present in 10 patients (6.6%) and the remaining 142/152 (93.4) had no history of alcohol abuse; only 3/152 patients (2.0%) had a history of tobacco usage (in any form), whereas majority comprised of the nonsmoker population 149/152 (98%).

The most common presenting complaint was that of abdominal pain 102/152 (67.1%) with associated loss of weight, appetite, and other symptoms in 50/152 (32.9%) patients. It was observed that the majority of patients had the primary lesion located in the antrum of the stomach 73/152 (48%) followed by the body (53/152; 34.9%) and cardia (26/152; 17.1%); type I and type II esophagogastric junction (20/152) Siewert classifications were equal (10 each; 38.5%) and the remaining 6 (23.1%) belonged to type III. In terms of pathology, as per World Health Organization (WHO) classification, the majority consisted of the SRH (signet ring histology) (102/152; 67.1%) followed by mucinous histology (36/152; 23.7%). Based on Lauren's classification, the diffuse variant was more prevalent (99/152; 65.1%). Most were poorly differentiated (65.1%). The majority were diagnosed at an advanced stage (III and IV= 54.6%).

Discussion

Gastric adenocarcinoma was thought to be a disease of the elderly and the geriatric population with only 1/10th of these in patients below the age of 45 years.⁸ This study was an attempt to address this issue from the Indian subcontinent thereby breaking the ice to open a road to better treatment options and screening programs and better recognition by

Table 1 Clinicopathological characteristics and risk factors

Clinicopathological characteristics and risk factors	n = 152	%
Age at diagnosis		
<20	0	0.0
20–30	30	19.7
31–39	122	80.3
Gender		
Male	36	23.7
Female	116	76.3
Alcoholic		
Yes	10	6.6
No	142	93.4
Smoker		
Yes	3	2.0
No	149	98.0
Family history		
Yes	3	2.0
No	149	98.0
Presenting complaints		
Abdominal pain	102	67.1
Others	50	32.9
Site of the primary disease		
Cardia	26	17.1
Body	53	34.9
Antrum	73	48.0
Siewert classification for cardia with gastroesophageal junction involvement		
Type I	10	38.5
Type II	10	38.5
Type III	6	23.1
Histopathology (WHO)		
Papillary	7	4.6
Tubular	7	4.6
Mucinous	36	23.7
Signet ring cell	102	67.1
Mixed	0	0.0
Histopathology (Lauren)		
Intestinal	40	26.3
Diffuse	99	65.1
Indeterminate	13	8.6
Grade		
Well differentiated	23	15.1
Moderately differentiated	30	19.7
Poorly differentiated	99	65.1

Table 1 (Continued)

Clinicopathological characteristics and risk factors	n = 152	%
TNM staging		
I	13	8.6
II	46	30.3
III	50	32.9
IV	33	21.7
Missing data	10	6.6

Abbreviations: TNM, tumor, node, metastasis; WHO, World Health Organization.

policyholders, healthcare workers, and those involved in providing cancer care. A recent study from 2019 by Zhao et al observed that the mean age of presentation is 35.6 to 40.5 years with female preponderance with the majority of tumors situated in the distal stomach with advanced disease at the time of presentation that is in direct concordance with our study.⁹

In comparison to other AYA-GC data published by Lee et al,¹⁰ we observed that all findings related to the age group of presentation, sex predilection, and advanced stage at presentation were in concordance; however, the Korean study comprised of patients of approximately 32% being smokers and 20% with a family history, whereas our study had a prevalence of nonsmokers and a negative family history in 98% of the patient population, suggesting thereby a more sporadic and aggressive variant in the Indian subcontinent.

Furthermore, it has been already published that the age more than 70 years is an independent poor prognostic factor in this group.¹¹ However, in comparison to this group of patients,^{12,13} we observed that in elderly patients, presentation in the form of upper gastrointestinal bleeds (such as black tarry stools, hematemesis, and anemia) tends to be more common as opposed to the resensation of abdominal pain in the AYA population. We also observed that relatively higher prevalence of gastric adenocarcinoma in men (72%) with a history of smoking (35–42%), moderately differentiated (poorly differentiated in AYA) and SRH being highly uncommon. Whereas SRH was found to be more common in our group of patients (67.1%).

Henceforth, it is evident from our study that AYA-GC group is under-represented and goes unacknowledged leading to a delay in diagnosis and treatment, thereby compromising the outcome in an already aggressive primary with a poor histology-associated disease process leading to untimely deaths and reduced overall survival. The mortality figures from Indian registries suffer from the problem of under-reporting because of problems in the registration of death and in reporting of cause of death.¹⁴ Similar challenges were faced in our retrospective data collection, and it stresses the importance of maintaining a prospective database. Our network cancer registry

software is now functional, and this collaborative effort shall help us in reporting authentic treatment outcomes in the future.

Conclusion

This is one of our country's first large multicenter studies on GC in the AYA population. There was a higher female prevalence, aggressive tumor behavior, and the majority of patients were diagnosed at a more advanced stage. The majority of the patients neither have a family history nor a smoking history. Awareness among general people, researchers, clinicians, and policymakers must be improved to better the loss of life years in the younger population.

Clinical Trials Registry-India (CTRI) Number: CTRI/2022/01/039233

Ethical Approval

The study was approved by the Institutional Ethics Committee (vide IMS.SH/SOA/2021/097 letter dated 07.07.2021). All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Funding

The authors are thankful to Biotechnology Industry Research Assistance Council (BIRAC) through the National Biopharma Mission to provide funding for the research.

Conflict of Interest

None declared.

References

- 1 Li J, Kuang XH, Zhang Y, Hu DM, Liu K. Global burden of gastric cancer in adolescents and young adults: estimates from GLOBOCAN 2020. *Public Health* 2022;210:58–64
- 2 De B, Rhome R, Jairam V, et al. Gastric adenocarcinoma in young adult patients: patterns of care and survival in the United States. *Gastric Cancer* 2018;21(06):889–899
- 3 Li J. Gastric cancer in young adults: a different clinical entity from carcinogenesis to prognosis. *Gastroenterol Res Pract* 2020; 2020:9512707. Doi: 10.1155/2020/9512707
- 4 Magrath I, Epelman S. Cancer in adolescents and young adults in countries with limited resources. *Curr Oncol Rep* 2013;15(04): 332–346
- 5 Wong MCS, Huang J, Chan PSF, et al. Global incidence and mortality of gastric cancer, 1980–2018. *JAMA Netw Open* 2021;4(07): e2118457. Doi: 10.1001/JAMANETWORKOPEN.2021.18457
- 6 Dhobi MA, Wani KA, Parray FQ, et al. Gastric cancer in young patients. *Int J Surg Oncol* 2013;2013:981654
- 7 Maheshwari U, Sharma M, Goel V, et al. Clinical profile and outcomes of treatment in gastric cancer in young patients in India. *Asian J Oncol* 2022;08(03):111–118
- 8 Al-Refaie WB, Hu CY, Pisters PWT, Chang GJ. Gastric adenocarcinoma in young patients: a population-based appraisal. *Ann Surg Oncol* 2011;18(10):2800–2807
- 9 Zhao D, Klempner SJ, Chao J. Progress and challenges in HER2-positive gastroesophageal adenocarcinoma. *J Hematol Oncol* 2019; 12(01):50
- 10 Lee J, Lee MA, Kim IH, Roh SY. Clinical characteristics of young-age onset gastric cancer in Korea. *BMC Gastroenterol* 2016;16(01): 110. Doi: 10.1186/s12876-016-0528-y
- 11 Liang YX, Deng JY, Guo HH, et al. Characteristics and prognosis of gastric cancer in patients aged ≥ 70 years. *World J Gastroenterol* 2013;19(39):6568–6578
- 12 Saidi S. P-327 gastric cancer in elderly patients. *Ann Oncol* 2020; 31:S196. Doi: 10.1016/j.annonc.2020.04.409
- 13 al Otaibi M, al Barak J, al Abbad J, Akbar A. Differences in presentation and outcomes among young and old patients with gastric cancer. *Ann Oncol* 2018;29:viii234
- 14 Dikshit RP, Mathur G, Mhatre S, Yeole BB. Epidemiological review of gastric cancer in India. *Indian J Med Paediatr Oncol* 2011;32 (01):3–11