



REVIEW ARTICLE

Gastro-Intestinal Cancer among Iraqi Patients

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Abstract

The incidence of gastro-intestinal cancers among Iraqis is reviewed from 1973-2021 in different Iraqi provinces. The incidence rates are also illustrated in relation to age, sex, site of cancer and year of registration. Incidence rate differs widely in relation to locality, age, sex and race. Many factors have been considered as Iraq exposed to the Iraq-Iran war, gulf war and the usage of uranium weapon in the south part of Iraq. In addition, oil wheel fire in gulf war in south of Basrah, as well as the pollution caused by cars and generators for electricity production that expected to have an effect on the increased cancer rate in Iraq. Impaired physiological and immunological functions with advanced age might have an effect on the increased rate of cancer. The highest incidence observed in colon and stomach. Thus, a national control program is vital for diagnosis and treatment for this disease.

Keywords

Cancer, Colorectal, Incidence, Iraq, Stomach

Introduction

Gastro-intestinal cancers are distributed worldwide. They are responsible for millions of morbidity and mortality. Thus, it is a public health problem in many parts of the world. In addition, gastro-intestinal cancer might be undetectable and unrecorded in many countries due to differences in the availability of screening programs and risk factors. Many types of cancer are very aggressive, diagnosed very late and might metastasis has developed making the chances for cures are doubtful. Despite great efforts to improve survival of patients with cancer through different modalities of

cancer therapy, successes are still limited. Generally, cancers were increased with increasing age [1].

Gastric carcinoma remains an obvious problem in the world despite records of decreasing incidence in United Kingdom and United States with a high incidence include Japan, Chile and parts of South Africa [2-6]. In Iraq, gastric cancer is the 9th common and the 2nd commonest gastrointestinal malignancy after colorectal carcinoma [7-10].

In Iraq, gastro-intestinal cancer accounted for 10.16% of total registered cases [11]. According to BCRG data for the years 2005-2008, cancer of the stomach ranked the 10th in all population and in males and 9th in females [12]. Colon-rectum cancer ranked 5th among males and 8th among females in Basrah over the period 2005-2008 [12].

Worldwide, around 80 million patients with colon cancer are diagnosed each year, which constitute about 10% of all reported cancers [13]. It is the most commonly diagnosed cancer in North America, Western Europe, and Australia, with a high mortality rate among males and females [14-16]. Worldwide, gastro-intestinal cancer is the 3rd most commonly diagnosed malignancy after lung and breast cancer [17]. Age has an influence on the incidence of colorectal cancer.

Thus, cancer is a big health problem in Iraq as far as number of cases, cost of treatment and the mortality are concerned. The present review aimed to determine the analysis of gastro-intestinal cancers data according to age, year of registration and cancer site over time.

Results and Discussion

The incidence rates of gastro-intestinal cancer are reviewed among Iraqi patients in different Iraqi provinces from 1973-2021. The incidence is varying from one province to another (Table 1 and Table 2).

Gastro-intestinal cancer became a major cause of death with an increasing worldwide especially in well developed countries. The increase in life expectancy in most countries together with changes in life style are expected to lead to cancer development. The

Table 1: Distribution of gastro-intestinal cancer in relation to province, years of registration, age and sex.

Reference	Province	Incidence years	Age (years)	Sex	
				Male	Female
Al-Saleem, et al. [40]	Baghdad	1972	27		-
Meziad, et al. [41]	Basrah, Thi-Qar, Missan	2005-2011	-	-	-
Raziq, et al. [35]	Duhok	2008-2013	21-93	90	65
Shahid, et al. [33]	Baghdad	2009-2014	60-70	29	21
Abood, et al. [42]	Basrah	2007-2015	29-85	24	23
Al-Dahhan & Lami [39]	Iraq	2002-2014	40-59	40%	46%
Al-Rubaie ,et al. [43]	Baghdad	2017-2019	40-69	31 (49.2)	32 (50.8)
Akram, et al. [38]	Diyala	2017	16-75	47	73
Amen, et al. [44]	Erbil & Duhok	2017	0-90	48 17	38 E 12 D
Dhahir & Noaman [30]	Baghdad	2012-2013	22-40	17	18
Abood, et al. [36]	Baghdad	2014-2016	20-70	43	31
Al-Abachi [45]	Mosul	2018-2020	6-90	174	83
Ibrahim, et al. [46]	Kirkuk	2019-2000	14-80	11333 (54.3)	9547 (45.7)
Amen, et al. [37]	Erbil & Duhok	2013-2019	51-70	998 461	795 E 366 D
Soliman & Mohamad [47]	Baghdad	2015-2021	60-90	-	(52)

E: Erbil; D: Duhok

Table 2: Incidence of gastro-intestinal cancers and their types in the Iraqi provinces.

Reference	No. examined	No. (%) incidence of gastro-intestinal cancers
Al-Saleem, et al. [40]	34	Small intestine
Meziad, et al. [41]	1601	Gastro-intestinal: Basrah 253 (15.8) Thi-Qar 143 (8.9) Missan 82 (5.1)
Raziq, et al. [35]	155	Gastric (87.7) Lymphoma (6.5) Gastro-intestinal stromal (4.5) Neuroendocrine (1.3)
Shahid, et al. [33]	50	Esophagogastric junction 44 (22) Body 10 (20) Antrum 18 (36)
Abood, et al. [42]	47	Stomach 21 (45) Jejunum/ileum 16 (34) Colorectal 5 (11) Duedenum 3 (6)

Al-Dahhan & Lami [39]	7246	Anal & anal junction 27 (3.8) Colon 315 (44.6) Rectosigmoid junction 15 (2.1) Rectum 349 (49.4)
Al-Rubaie, et al. [43]	63	Rectum & sigmoid region (77.8) Rectum alone 37 (58.7) Sigmoid colon 12 (19.0) Cecum 7 (11.1) Ascending colon 2 (3.2)
Akram, et al. [38]	120	Stomach 2 (1.67) Esophagus 1 (0.83)
Amen, et al. [44]	-	Colorectal 38748 (7.6) Stomach 29
Dhahir & Noaman [30]	35	Colorectal
Aboud, et al. [36]	74	Rectosigmoid 17 (22.9) Sigmoid 9 (12.1) Descending colon 6 (12.1) Transverse colon 2 (2.7) Ascending colon 7 (9.4) Caecum 16 (21.6)
Al-Abachi [45]	257	Colon (13.2)
Ibrahem, et al. [46]	20880	Rectum (37.2) in 2000 (31.4) in 2019 Rectosigmoid (3.6) in 2000 (2.0) in 2019 Colon 13774 (66.0)
Amen, et al. [37]	1573 E 7330 D	Colorectal 1191 E 582 D Stomach 604 E 239 D Small intestine 58 E 6 D
Soliman & Mohamad [47]	60	Left colon.

E: Erbil; D: Duhok

availability of palliative stomas may be contributed to late detection and advanced disease.

The cause is not explained till now but many factors have been considered as Iraq exposed to the Iraq-Iran war, gulf war and the usage of uranium weapon in the south part of Iraq. In addition, oil wheel fire in gulf war in south of Basrah, as well as the pollution caused by cars and generators for electricity production might have an effect on the increased cancer rate in Iraq. Most cases of colorectal cancer appears to be related to environmental factors, as fast-food with high fat consumption is related to a higher incidence of CRC, in comparison to low fat diet rich in fruits and vegetables [18-24]. Patients with gastrointestinal cancer and Type 2 diabetes mellitus have a higher risk of mortality than

patients without [25]. Excess body weight and diet may also increase colorectal cancer risk [18,26]. Cigarette smoking and Shisha pipe may be differentially associated with colorectal cancers [27].

The highest incidence observed in this review is colon and stomach cancers (Table 2). Colorectal cancer is rarely diagnosed before the age of 40. The incidence of this malignancy increases dramatically between 45 and 50 years of age, with 90% of cases occurring after the age of 50 years; consequently, deaths from colorectal cancer begin to increase slowly in the 5th decade of life [28,29] (Table 2). In contrast, it has been noticed in Baghdad province the colorectal cancer does not only affect older people, but young people as well (28.6%) [27]. An old study in Iraq (1980) observed that

30.2% of patients with cancer of the colon were under 40 years of age [31]. The rate of colorectal cancer in this study is much higher compared to a study conducted in Basra-Iraq, where the incidence of the disease was 6.5/100,000 populations [32].

Although gastric cancer is rare before the age of 40 years, a study in Baghdad has noticed that 22% of patients were below the age of 40 [33]. This is probably due to higher incidence of *Helicobacter pylori*. Gastric cancer presents most commonly in the 5th and 6th decades of life [34]. The peak age group was 60-70 years and was similar to previous studies in Iraq [7-10].

In respect to male: female frequency the male was more commonly affected than female [33,35,36], which was similar to many countries in the world [2-4]. Never the less, few studies have reported the incidence is more among females rather than males [37-39].

Conclusions

Colorectal cancer is most common among older people of both sexes, yet it also occurs in younger people as well. The highest incidence observed was colon and stomach. It is an important disease and remains challenge to the surgeons and since the early diagnosis of gastro-intestinal cancer is vital in the treatment and prognosis of the disease.

Implementing a national control program should include a primary health care, health education, well-balanced diet, environmental sanitation and health education to stress the important of the hazard of risk factors.

Acknowledgements

Not applicable.

Author Contribution

All authors have involved in collecting data and righting up.

Funding

None.

Availability Data and Materials

All data and materials have reviewed from already published articles.

Declarations

Ethics approval and consent to participate

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors have declared that no competing interest exists.

References

1. Ma X, Yu H (2006) Global burden of cancer. *Yale J Biol Med* 79: 85-94.
2. Ashley SW, Evoy D, Daly JM (1999) Stomach. In: Schwartz, Shires, Spencer, Daly, Fischer, Galloway, Principles of Surgery. (7th edn), McGraw-Hill, New York 1201-1205.
3. Armstrong CP, Dent DM (1985) Gastric carcinoma. *Journal of the Royal College of Surgeons of Edinburgh* 30: 15-21.
4. Oschner A, Weed TE, Nuessle WR (1981) Cancer of the stomach. *Am J Surgery* 141: 10-14.
5. Allum WH, Powell DJ, McConkey CC, Fielding JW (1989) Gastric cancer: A 25-year review. *Br J Surgery* 76: 535-540.
6. Dent DM, Vader CG (1981) Malignant gastro-intestinal tumours. The frequency distribution by age, sex, race and site at Groote Schuur Hospital, Cape Town 1974- 1978. *South African Med J* 60: 883-885.
7. Barnouti HN (1992) Gastrointestinal malignancies. *J Comm Med Baghdad* 5: 45-51.
8. Kassir ZA (1993) Gastric carcinoma in Iraq: Evaluation of clinical and diagnostic procedures *J Fac Med Baghdad* 35: 169-173.
9. Al-Bahrani ZR, Al-Bahrani AZ (2014) The changes in the incidence of gastric versus colorectal cancer in Iraq during the period between 1965-2006. *TOFIQ J Med Sci* 1.
10. Iraqi Cancer Registry Reports 2009-2011.
11. Iraqi cancer board report of cancer registry 2009. Ministry of Health, Baghdad 2012.
12. BCRG. Cancer in Basrah: Epidemiological analysis of incident cancer 2005-2008. Basrah Cancer Research Group. Basrah, Dar Al-Kutub for Publication and Press 2010.
13. Jemal A, Center MM, DeSantis C, Ward EM (2010) Global patterns of cancer incidence and mortality rates and trends. *Cancer Epidemiol Biomarkers Prev* 19: 1893-1907.
14. American Cancer Society (2018) Global cancer facts and figures. (4th edn), Atlanta: American Cancer Society Inc 2018.
15. Boyle P, Langman JS (2000) Epidemiology *BMJ* 321: 805-808.
16. Boyle P, Leon ME (2002) Epidemiology of colorectal cancer. *Br Med Bull* 64: 1-25.
17. Siegel RL, Miller KD, Jemal A (2015) Cancer statistics, 2015. *CA Cancer J Clin* 65: 5-29.
18. Whittemore AS, Wu-Williams AH, Lee M, Zheng S, Gallagher RP, et al. (1990) Diet, physical activity and colorectal cancer among Chinese in North America and China. *J Natl Cancer Inst* 82: 915-926.
19. O'Keefe SJ, Kidd M, Espitalier-Noel G, Owira P (1999) Rarity of colon cancer in Africans is associated with low animal product consumption, not fiber. *Am J Gastroenterol* 94: 1373-1380.
20. López PJ, Albero JS, Rodríguez-Montes JA (2014) Primary and secondary prevention of colorectal cancer. *Clinical medicine insights. Gastroenterology* 7: 33-46.
21. Magalhaes B, Peleteiro B, Lunet N (2012) Dietary patterns and colorectal cancer: Systematic review and meta-analysis. *Eur J Cancer Prev* 21: 15-23.
22. Howe GR, Benito E, Castelleto R, Cornée J, Estève J, et al.

- (1992) Dietary intake of fiber and decreased risk of cancers of the colon and rectum: evidence from the combined analysis of 13 case-control studies. *J Natl Cancer Inst* 84: 1887-1896.
23. Bingham S, Day NE, Luben R, Ferrari P, Slimani N, et al. (2003) Dietary fibre in food and protection against colorectal cancer in the European Prospective Investigation into Cancer and Nutrition (EPIC): An observational study. *Lancet* 361: 1496-1501.
 24. Giovannucci E (2002) Modifiable risk factors for colon cancer. *Gastroenterol Clin North Am* 31: 925-943.
 25. Dehal AN, Newton CC, Jacobs EJ, Patel AV, Gapstur SM, et al. (2012) Impact of diabetes mellitus and insulin use on survival after colorectal cancer diagnosis: the Cancer Prevention Study-II Nutrition Cohort. *J Clin Oncol* 30: 53-59.
 26. Chen K, Xia G, Zhang C, Sun Y (2015) Correlation between smoking history and molecular pathways in sporadic colorectal cancer: A meta-analysis. *Intn J Clin Exp Med* 8: 3241-3257.
 27. Dabbagh R (2017) Current Trends of Substance Use in Iraq: Examining Data from the 2014 Iraqi National Household Survey of Alcohol and Drug Use: University of California, Los Angeles.
 28. Miller AB (1983) Trends in cancer mortality and epidemiology. *Cancer* 51: 2413-2418.
 29. Eddy DM (1990) Screening for colorectal cancer. *Ann Intern Med* 113: 373-384.
 30. Dhahir NK, Noaman AA (2021) A comparative study of colorectal cancer based on patient's age. *J Fac Med Baghdad* 63: 70-73.
 31. Al-Bahrani ZR, Al-Khateeb AK, Dezayi O, Butrous GS (1980) Cancer of colon and rectum in Iraq. *Am J Proctol Gastroenterol Colon Rectal Surgery* 31: 20-22.
 32. Abood RA, Abdahmed KA, Mazyed SS (2020) Epidemiology of different types of cancers reported in basra, Iraq. *Clin Basic Res* 20: 295-300.
 33. Shahid MH, Jawad SR, Abbas AA (2017) Experience of gastric cancer in Al- Sadder City in Baghdad. *Iraqi Postgraduate Med J* 16: 129-137.
 34. Brien PO (1988) Stomach and Duodenum. In: Eilliamson RCN, Waxman BP, Scott an aid to clinical surgery. (6th edn), churchill Livingstone, Singapore, 249- 252.
 35. Raziq AH, Haj SM, Arif SH, Odeesh OY (2017) Gastric malignancies and the trend of gastric carcinoma in Duhok City-Iraq. *Med J Babylon* 14: 162-168.
 36. Abood MA, Habash MM, Mohammed MJ (2022) Epidemiology of colonic cancer in Baghdad city, Iraq. *Iranian J War Pub Hlth* 14: 331-337.
 37. Amen KM, Abdullah O, Amin A, Hasan B, Mohamed Z, et al. (2021) Cancer statistics in kurdistan region of Iraq: A tale of two cities. *Research Square*.
 38. Akram B, Mohammed SS, Mohammed AA, Obaid KA (2019) Significance of endoscopic findings in patients with dyspepsia in diyala province - Iraq hospital based study. *Diyala J Med* 17: 107-114.
 39. Al-Dahhan SA, Al-Lami FH (2018) Epidemiology of colorectal cancer in Iraq, 2002-2014. *Gulf J Oncol* 26: 23-26.
 40. Al-Saleem T, Al-Bahrani Z (1973) Malignant lymphoma of the small intestine in Iraq (Middle East Lymphoma), *Cancer* 31: 291-294.
 41. Meziad SS, Habib OS, Strak SK (2014) Gastrointestinal tract cancer in Basrah: Time, place and histopathological characteristics. *Med J Basrah Uni* 32: 55-62.
 42. Abood RA, Alasady O, Khalaf AA (2018) Gastrointestinal stromal tumors in southern Iraq: Clinico-pathologic patterns and risk stratification *Am J Biomed* 7: 432-440.
 43. Alrubaie A, Alkhalidi N, Abd-Alhusainc S (2019) A clinical study of newly-diagnosed colorectal cancer over 2 years in a gastroenterology center in Iraq. *J Coloproctol* 39: 217-222.
 44. Amen KM, Abdullah OS, Amin AMS, Mohamed ZA, Bestoon Hasan B, et al. (2021) Cancer incidence in the Kurdistan region of Iraq: Results of a seven-year cancer registration in erbil and duhok governorates. *Asian Pac J Cancer Prev* 23: 601-615.
 45. Al-Abachi KT (2022) Diagnostic yield of colonoscopy in lower gastrointestinal bleeding in Mosul. *Duhok Med J* 16: 1-2.
 46. Ibrahim S, Ahmed H, Zanganac S (2022) Trends in colorectal cancer in Iraq over two decades: Incidence, mortality, topography and morphology. *Ann Saudi Med* 42: 252-261.
 47. Soliman NF, Mohamad BJ (2022) Clinical and histopathological characteristics of colorectal cancer in Iraq between 2015-2021. *Arch Razi Insitute* 77: 2407-2413.