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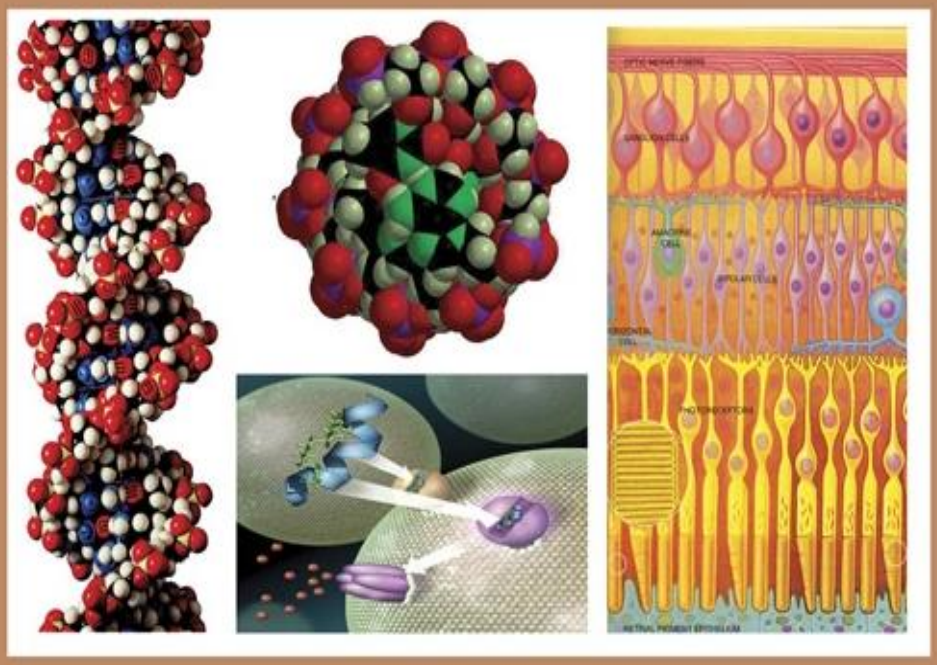

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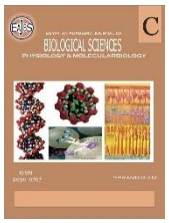

Epidemiological, Clinical, and Pathological Characteristics of Gastric Carcinoma in The Northwest Region of Algeria: A Single Center Study

Cherifi Yasmina [1,2], Haoud Khadidja[1], Drici Amine Mokhtar [1], Sasaa Elcherifa[1,2], Ouali Siheme[1], Kanoun Khedoudja[1,2] and Djamila Yekrou [3].

1- Biology Department, Faculty of Natural Sciences and Life, Djillali Liabes University of Sidi-Bel-Abbes, BP No. 89 Sidi-Bel-Abbes 22000 Algeria.
2- Laboratory of Molecular Microbiology Health and Proteomics, Faculty of Natural Sciences and Life, Djillali Liabes University of Sidi-Bel-Abbes, BP No. 89 Sidi-Bel-Abbes 22000 Algeria.
3- Departement of medical oncology. Anti-cancer centre of Sidi Bel Abbes. Algeria.

***E-mail:** cherifi.yasmina90@gmail.com

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ABSTRACT

Introduction: Cancer of the stomach is a serious public health issue due to its frequency and severity. It is one of the most common causes of cancer-related death for both sexes and is a major contributor to the global burden of disease. To better understand the epidemiological, clinical, and pathological characteristics of gastric cancer in the Western Algerian region Sidi Bel Abbes, our study aimed to investigate the prevalence, risk factors, and clinical outcomes of gastric cancer in this region.**Methods:** The medical records of 131 patients with gastric cancer in the Sidi Bel Abbes region between January 2015 and December 2019 were reviewed retrospectively in order to gain insight into the epidemiology of gastric cancer in the region.**Result:** The results of this statistical analysis indicate that there is a male predominance in the cases studied and that the average age of the patients is 61.069 years. Histologically, carcinoma is the most common histological type (87.7%). 77.1% of cases were diagnosed in stages III and IV of TNM, and 46.6% of cases were found in the pyloric antrum. 38.2% of the cases had atrophic chronic gastritis as a precancerous lesion, and 16.8% had acute or chronic gastritis. **Conclusion:** The diagnosis of gastric cancer is often made at a late stage with a poor prognosis. However, in order to develop strategies for prevention and early detection, extensive research is still needed to identify the risk factors for gastric cancer.

INTRODUCTION

One of the most common types of cancer worldwide is stomach cancer. It is an aggressive disease with a poor five-year prognosis (Matsuoka *et al.,* 2018). According to the GLOBOCAN 2020 report, stomach cancer is the fourth leading cause of cancer deaths in both sexes, accounting for approximately 800,000 deaths (7.7% of all cancer deaths). According to Sung *et al.,* 2020, approximately 1.1 million new stomach cancer cases are expected in 2020 (representing 5.6% of all cancer cases).

A huge portion of gastric cancer occurs in developing countries. In contrast to the high incidence rate observed in East Asia (for example, Mongolia, Japan, and the Republic of Korea), northern Europe and northern America exhibit relatively low incidence rates that are comparable to those observed in African countries (Bray *et al.*, 2018). Algeria has a lower incidence of this disease than developed countries and slightly higher than the Maghreb countries (Hussein *et al.*, 2016). The purpose of this study was to establish an epidemiological profile of gastric adenocarcinoma in the north-western region of Algeria, to determine the frequency of stomach cancer, and to describe the clinical, biological, and pathological factors involved.

MATERIALS AND METHODS

Population:

A retrospective descriptive survey was conducted on 131 patients with gastric cancer admitted to the Anti-Cancer Center in Sidi Bel Abbes between January 2015 and December 2019.Anatomopathological and medical data from the patient's medical records were reviewed for the following: age, gender, type of neoplasia, personal, family, and surgical history. In this study, only patients with a confirmed pathological cell type and adequate medical records were included.

Statistical Analyses:

For the statistical analysis, data were summarized using rates and cross-tabulations. Graphs and tables were used to present the results. SPSS 22.0 (Statistical Package for the Social Sciences, IBM Corporation; Chicago, IL. August 2013) was used to process and analyze all data.

RESULTS

There was a clear male predominant (67.34 percent of 84 patients) in the study, as well as a male-to-female ratio of 1.78. The average age of our patients ranged from 33 to 86 years was 61.069±12.449 years (62.167±11.898 years in men, 59.106±13.283 years in women). The distribution of patients based on their age groups is presented in Figure 1.

Carcinoma made up 87.8% of the cases, a MALT lymphoma made up 7.6%, and a gastrointestinal stromal tumor made up 3.8%. ln accordance with Lauren's classification, 42.7% of these carcinomas were of the intestinal type, followed by the mixed type and diffuse type of respective frequencies of 30.5% and 26.7% (Table 1).

There were 46.6% of tumor cases located in the antropyloric region, 32.8% in the fundus, and 15.3% in the cardia based on the tumor topography. According to Table 2**,** epigastralgia was the most commonly reported clinical sign (76.3%), followed by vomiting (71.0%), gastrointestinal bleeding (44.3%), and hematemesis (38.2%).

According to Table 3, we found the following precancerous lesions: 38.2% of cases were atrophic chronic gastritis, 16.8% were acute or chronic gastritis, 9.16% were gastric ulcers, 2.3% were partial gastrectomy stumps, and 7.6% were associated with a family history of gastric cancer. According to the findings of this study, smoking and Helicobacter pylori infection were the main risk factors.

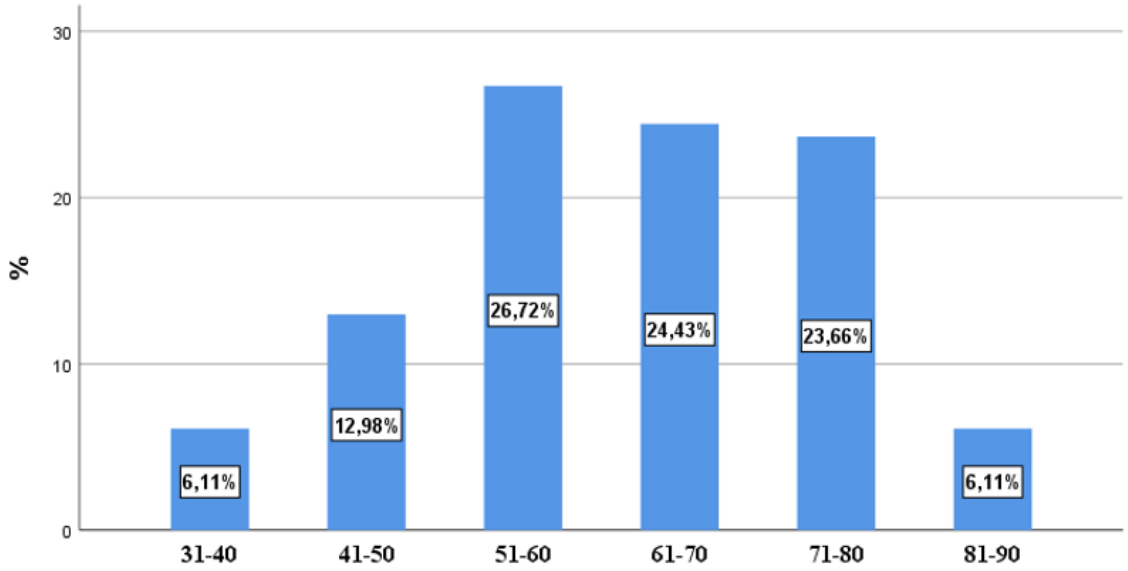

Fig. 1: Age distribution of patients.

Table1: Clinical and pathological characteristics of gastric cancer patients based on gender.

	Males (67.34%) N (%) or Mean±SD	Females (32.66%) N (%) or Mean±SD	Total N (%) or Mean±SD	P value
Age	62.167±11.898	59.106±13.283	61.069±12.449	0.839
Histologic type				
Carcinoma	74 (88.1%)	41(87.2%)	115(87.8%)	
Gastrointestinal stromal tumor	5(6.0%)	0(0.0%)	5(3.8%)	
MALT lymphoma	4(4.8%)	6(12.8%)	10(7.6%)	0.117
Neuro-endocrine	1(1.2%)	0(0.0%)	1(0.8%)	
Lauren's classification				
Intestinal	39(46.4%)	17(36.2%)	56(42.7%)	
Diffuse	23(27.4%)	17(36.2%)	40 (30.5%)	0.466
Mixed	22(26.2%)	13(27.7%)	35(26.7%)	
Pt				
T1	12(14.3%)	3(6.4%)	15(11.5%)	
T2	14(16.7%)	11(23.4%)	25(19.1%)	0.458
T3	45(53.6%)	27(57.4%)	72(55.0%)	
T4	13(15.5%)	6(12.8%)	19(14.5%)	
PN				
N0	24(28.6%)	9(19.1%)	33(25.2%)	
N1	20(23.8%)	14(29.8%)	34(26.0%)	
N2	25(29.8%)	14(29.8%)	39(29.8%)	0.645
N3	15(17.9%)	10(21.3%)	25(19.1%)	
Pm				
M0	69(82.1%)	39(80.0%)	108(82.4%)	
M1	13(15.5%)	8(17.0%)	21(16%)	0.558
M2	2(2.4%)	0(0.0%)	2(1.5%)	
TNM stage				
I/II stages	20(23.8%)	10(21.2%)	30(22.9%)	0.514
III/IV stages	64(76.2%)	37(78.7%)	101(77.1)	
Tumor topography				
antropyloric	43 (51.2%)	18(38.3%)	61(46.6%)	0.156
Cardia	15(17.9%)	5(10.6%)	20(15.3%)	0.271
Fundus	27(32.1%)	16(34.0%)	43(32.8%)	0.824
Corpus	5(6.0%)	2(4.3%)	7(5.3%)	0.679

Table2: The medical history of the patient.

Medical history	Number (%)
Personal history of tumor	2 (1.5%)
Family History of tumor gastric	10 (7.6%)
Family history of tumor	14(10.7%)
Gastric ulcer	30 (22.9%)
Atrophic chronic gastritis	50(38.2%)
Acute or Chronic gastritis	22(16.8%)
Partial gastrectomy stump	3(2.3%)
Helicobacter pylori infection	55(41.99%)
Tobacco	40(30.53%)
Alcohol	12(9.16%)

Table3: A description of the signs and symptoms.

Clinical signs	Number (%)
Epigastralgia	100(76.3%)
Vomiting	93(71.0%)
Gastrointestinal bleeding	58(44.3%)
Hematemesis	50(38.2%)
Asthenia	94(71.8%)
Abdominal pain	91(6905%)

DISCUSSION

Associated with genetic and environmental factors, stomach cancer is a heterogeneous disease that has an extremely poor prognosis.

This study found an average age of 61.069 ± 12.449 years. Gastric cancer is considered by the majority of authors to be a disease affecting older men, which is in agreement with our findings (Elghali *et al.*, 2018; Behar *et al.*, 2021). In fact, the average age of patients with gastric cancer often varies between 60 and 80 years (Nagini, 2012).

ln several studies, gastric cancer affects more men than women, which is consistent with our finding of 1.78 (male-to-female) (Fadlouallah et al., 2015 and Ferlay *et al.*,2021). As well as this, it has been suggested that gender differences reflect physiological differences; estrogens have been shown to protect women from gastric cancer (Sheh *et al.*, 2011 and Derakhshan et al., 2009). According to a Korean Study (Shin et al., 2011), no statistically significant differences were observed between the genders.

In our series,carcinoma was the most common histological form with 87.8% ; several authors (Ntagirabiri *et al.*, 2013; Karimi *et al.*, 2014) have reported this. Based on the results of Chen et al., 2016, 46.3% of cases had an intestinal type, 32.6% had a diffuse type, and 21.1% had a mixed type, according to Lauren's classification. Similar results were found in our series. Tang *et al.*, 2021 found that intestinal type was more prevalent than diffuse types (71.11% vs 28.9%). The majority of patients were diagnosed at advanced and metastatic stages (77.1%) of cancer, which is consistent with data provided by (Togo *et al.*, 2011). Moreover, 22 patients (17.8%) presented with distant metastases, including two patients (1.5%) that had two sites of metastasis. Early detection rates of gastric cancer (relatively curable) have exceeded 70% in Japan as a result of gastric cancer screening programs, where gastric cancer incidence is still high (Yashima *et al.*, 2022).

According to the findings of a recent Moroccan study by Amrani Hassani Joutei *et al.*, 2020 local lymph node invasion occurs at approximately equal rates at N0, N1, N2, and N3, respectively (27.55%, 26.53%, 26.53%, 19.39%), which is in agreement with our findings.

The majority of patients in our study [100] (76.3%) suffer from epigastralgia, as well as those in other series (44.4% to 100%) (Sano *et al.*, 2004; Meyer *et al.*, 2002). In our study (71%) [93] patients suffered from vomiting. This is a significant difference from the 17.5% and 20% rates reported by Hosseini *et al.*, 2007 and Heise *et al.*, 2009 respectively. This difference could be explained by the high frequency of advanced-stage antral tumors in our series.

Antropyloric regions were most affected in the present study (46.6%) followed by fundus regions (32.8%). These data are very similar to those reported by two studies (Togo *et al.*, 2011) and (Amegbor et al., 2008). According to Layke & Lopez, 2004 Helicobacter pylori infection is associated with a high antropyloric localization.38.2% of the cases had atrophic chronic gastritis as a precancerous lesion, while 16.8% had acute or chronic gastritis. As illustrated in Correa's diagram 1992, infection with H. pylori causes gastritis, which, after several years of chronic evolution, can progress to gastric carcinoma in up to 2% of patients.

In our study, we found a similar percentage of gastric ulcers (22.9%) as Bouglouga *et al.*, 2015, but not Fehim *et al.*, 2017, who found 58.8%. The history of partial gastrectomy is considered as risk factor for gastric stump cancers 10-15 years after surgery (Takeno *et al.*, 2014). In our study, we found 2.3% of partial gastrectomy stumps, similar to those reported by Fehim *et al.*, 2017.

In addition, several studies indicate that 10% of gastric cancer cases are inherited (Lv *et al.*, 2021). We found in this study that 7.6% of our patients had a family history of gastric cancer.In 1994, the International Agency for Research on Cancer recognized Helicobacter pylori as the first bacterium associated with cancer pathology. Our findings revealed that 41.99% of patients were positive for H. pylori infection and 30.53 % were smokers. Numerous meta-analyses suggest that individuals with H. pylori are more likely to develop gastric cancer compared to the control group (Holmes *et al.*, 2021).

In numerous studies, smoking has been demonstrated to contribute to stomach cancer development (Poorolajal *et al.*, 2020; Li *et al.*, 2019). However, a study by Butt *et al.*, 2019 found that current smoking was associated with a higher risk of gastric cancer, but only in individuals seropositive for H. pylori.

A reduction in gastric cancer risk can be achieved by eliminating H. pylori from the first-degree relatives of subjects with the disease, as well as from those with atrophic gastritis. H. pylori eradication also appears to reduce the risk of gastric carcinoma in individuals with gastritis and non-atrophic gastritis. However, more research is needed to determine the ideal treatment strategy to prevent the development of gastric cancer in these groups.

Our study found that 9.16% of our patients consumed alcohol or had previously consumed alcohol. Alcohol consumption has been shown to increase the risk of stomach cancer (Tramacere *et al.*, 2012). In a meta-analysis conducted by Ma *et al.*, 2017, even lower levels of alcohol consumption can increase the risk of gastric cancer. Furthermore, more recent studies indicate that alcohol-induced DNA damage may play an important role in the pathogenesis of gastric carcinogenesis, which may explain the increased risk for disease associated with excessive alcohol intake (Seitz *et al.*, 2007; Zhang *et al.*, 2018).

CONCLUSION

The most common histological type of gastric cancer is carcinoma. It is more prevalent in males than in females. Several factors contributed to the development of this carcinoma, the most significant of which was the infection with Helicobacter pylori and the smoking of cigarettes. A person with gastric carcinoma is frequently diagnosed at a late stage with a poor prognosis, thereby minimizing the likelihood that it can be successfully treated. Prevention and early detection should continue to be priorities.

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Conflicts of Interest*:* The authors have no conflicts of interest to declare.

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