

# Current approaches to gastric cancer in Peru and Mexico

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**Abstract:** In Peru, the incidence of gastric cancer is reported to be around 15.8 per 100,000 inhabitants and it is the second most common oncological disease in men and the third one in women. Additionally, a high mortality index was reported, especially among poor people. To address this issue, in 2008, Peru initiated several insurance treatment plans of oncological diseases with promising results. In Mexico, there is a high predominance of gastric cancer in male gender compared to female gender, even reaching a 2/1 ratio, and the detection rate of early gastric cancer is low (10% to 20%) which results in a mainly palliative treatment with an overall survival rate in 5 years about 10% to 15% only. In Peru, the average age at diagnosis is around 62.96±14.75 years old and the most frequent symptoms includes abdominal pain, indigestion, loss of appetite, weight loss and gastrointestinal bleeding, while in Mexico, some studies reported an average age at diagnosis around 60.3±4.1 years old (range, 23–78 years old) and the most frequent symptoms were postprandial fullness (74.4%), abdominal pain (37.2%), weight loss (18.6%), and melena (4.6%). The anemia rate was 65.1% with a mean Hb level of 6.14 g/dL. In Peru, the most common gastric cancer type is the intestinal-type adenocarcinoma (around 34%), followed by the diffuse-type adenocarcinoma (18.7%), whilst among Mexicans, the diffuse-type was reported in 55.2% of cases, the intestinal-type was reported in 28.2% and the undifferentiated-type corresponded to 6%. In both, Peru and Mexico, 90% of the associated factors includes tabaquismo, diets rich in salt, smoked foods, and a sedentary lifestyle. Family inheritance and advanced age and pharmacological-resistant *Helicobacter pylori* infection are also important. Poverty has been heavily associated with a higher incidence of gastric cancer. The management of gastric cancer patients in Peru is carried out by general surgeons or general surgical oncologists. In recent years, efforts have been made by the Peruvian government to establish specialized surgical centers which resulted in an improvement in morbidity and mortality rates, as well as an increase in the retrieval of lymph nodes. In Mexico, during the last 5 years, D1+ has been reported to be the most predominant lymphadenectomy-type, particularly in specialized surgical services. There have been a decrease in mortality rate from 7.5 per 100,000 inhabitants in 2000 to 5.6 per 1,000,000 inhabitants in 2012. Additional steps in order to continue improving gastric cancer management in Peru and Mexico are needed.

**Keywords:** Approach; gastric cancer; Peru; Mexico

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## Introduction

According to GLOBOCAN, in Peru, the incidence of gastric cancer is reported to be around 15.8 per 100,000 inhabitants (1). It is considered to be aggressive and also very frequent among Peruvian population and as an example, it is actually the second most common oncological

disease in men and the third most frequent one in women (1,2). Additionally, a high mortality index in Peruvian gastric cancer patients has been reported, particularly among those who belong to traditionally underserved areas including people from poor socioeconomic backgrounds and those who lives in the highlands, particularly in Cusco, Pasco, and Huanuco (2).

In order to address the previous issue, in 2008, Peru had initiated an insurance plan of oncological diseases, as part of a previously established national health insurance system (SIS) with some success. This initial effort was potentiated by another scheme of oncological insurance called Plan Esperanza, which had been initialized in November 2012 and is the most recent effort of the Peruvian government for improving the health of oncological patients including those that suffer from gastric cancer (3).

Another country with a significant incidence of gastric cancer is Mexico where it constitutes one of the most frequent gastrointestinal malignancy with a high predominance of males compared to females, even reaching a 2/1 ratio, according to several studies (4,5). The detection rate of early cases of gastric cancer in Mexico is low (around 10–20%) which means the treatment is mainly palliative and the overall survival rate in 5 years is only around 10–15% (5).

### Clinicopathologic characteristics

Despite being a very serious disease in Peru, there are not a nationally screening program in place for early detection of gastric cancer patients. As a result, the majority of the cases are detected when the disease is clinically evident and the mean age at diagnosis is about  $62.96 \pm 14.75$  years old (3). Among the most frequent symptoms are included abdominal pain, indigestion, loss of appetite, weight loss, gastrointestinal bleeding, and others (3,6). Unfortunately, those manifestations are evident when the disease is already in the advanced stage (6).

Regarding the histological types of gastric cancer in Peru, the most common reported one is the intestinal-type adenocarcinoma (around 34%), followed by the diffuse-type adenocarcinoma (18.7%) and the less common one was the primary gastric lymphoma (close to 4%) (3).

In Mexico, some studies reported an average age at diagnosis around  $60.3 \pm 4.1$  years old (range, 23–78 years old) and the most frequent symptoms were postprandial fullness (74.4%), abdominal pain (37.2%), weight loss (18.6%) and melena (4.6%) (5). Additionally, anemia was reported to be as high as 65.1% with a mean Hb level of 6.14 g/dl. The tumor was localized in the antrum in 60% of cases, followed by body (27.9%) and fundus and body in 8.6% (5,7).

In a study published by Martínez-Galindo *et al.* (7), the histological types of the gastric adenocarcinoma was reported as follows: diffuse-type was reported in 55.2% of cases, intestinal-type was reported in 28.2% and undifferentiated-type corresponded to 6%. The

diffuse type was associated with less than 50 years of age, perineural invasion, positive surgical margins, and positive angioinvasion.

### Risk factors

In Peru, 90% of the associated factors includes tabaquism, diets rich in salt, smoked foods, and a sedentary lifestyle. Family inheritance and advanced age are also among important risk factors (6). Interestingly, the alcohol consumption among the Peruvian population was reported to be as high as 60% but it was not found to be associated with a highest incidence of developing gastric cancer (6,8).

Another interesting finding is the association of gastric adenocarcinoma with *Helicobacter pylori* infection, which is relatively commonly found among those with gastric cancer, but also, it has been demonstrated in recent studies, the increasing pharmacological resistance of *Helicobacter pylori* to standard antibiotic use for eradication in the Peruvian population (8).

The same risk factors described for Peruvian population also applies to the Mexicans, and among those risks, poverty has been heavily associated with a higher incidence of gastric cancer in Mexico (9). For example, in 2012, the state of Chiapas, which is regarded as one of the poorest states in Mexico, also had the highest death rate for gastric cancer (around 8.2 per 100,000 inhabitants; 95% CI: 7.3–9.0) (9,10). It is hypothesized that this association obeys to an increasing prevalence of *Helicobacter pylori* infection among poor population due to poor sanitary conditions of drinking water in rural areas of Mexico (9–11).

### Management and outcomes

Traditionally, in Peru, the vast majority of gastrointestinal malignancies including gastric cancer has been managed by general surgeons or general surgical oncologists. This continues to be the predominant reality in the majority of hospitals in Peru (12).

In recent years, efforts have been made to treat gastric cancer patients in specialized surgical centers in major referral hospitals in Peru. This is a relatively new challenging experience that aims to provide the best standard of care available to this patients and as a result, it is expected to obtain short and long-term outcomes comparable with international standards (12,13).

Treatment was followed according to the Japanese gastric cancer treatment guidelines published by the Japanese

Gastric Cancer Association (13,14). Since then, several centers had been reported an improvement in morbidity and mortality rates, as well as an increment in the retrieval of lymph nodes. For example, one center reported a morbidity of 22.7% and hospital mortality of 2.8% in 243 consecutive gastric cancer surgery patients and the mean number of resected lymph nodes was  $37.3 \pm 12.4$  for distal gastrectomy and  $45.3 \pm 14.5$  for total gastrectomy (12,15).

Overall, in Peru, the survival rate was reported to be around  $29.7 \pm 0.8$  months and it was also reported to have a better survival rate if the patient had less than 60 years old, had a female gender or had an intestinal-type adenocarcinoma (3). Additionally, according to several studies, the high mortality rate among Peruvian population is due to a lack of available screening methods, lack of an appropriate number and/or training of the required specialists including oncologists, gastric surgeons, surgical oncologists, gastroenterologists, among others; and due to high costs of performing upper gastrointestinal endoscopy (3,12,15). Such issues should be addressed in order to get better outcomes in the treatment of gastric cancer patients.

In Mexico, the most common surgical treatment for lymphadenectomy had been D1 lymph node resection with a reported perioperative morbidity and mortality incidence of 4.6% and 2.3%, respectively (5). Nevertheless, during the last 5 years, D1+ has been reported to be the most predominant lymphadenectomy type in surgical services in Mexican hospitals, with an increasing predominance of D2 lymph node resection mainly in specialized centers with high-volume of gastric cancer cases (16,17). As a result, there have been several reports showing a decrease in mortality rate for gastric cancer from 7.5 per 100,000 inhabitants in 2000 to 5.6 per 1,000,000 inhabitants in 2012 (9,17).

Recently, several studies had reported a reduction in the incidence of Gastric cancer in Mexico, but it still continues to be a major health issue with a negative social impact (11,16). In order to reduce this impact and to improve the outcomes in gastric cancer patients, some necessary steps had been proposed including establishing an improved sanitation system and ensuring access to potable water, which will reduce the infection of *Helicobacter pylori* of drinking water and ultimately will reduce the incidence of gastric cancer (18). Additional steps to take in Mexico, includes the implementation of a screening system in high-risk population in order to detect early gastric cancer cases, the improvement in the surgical management of gastric cancer cases according with the Japanese guidelines, and

the establishment of a multimodality approach to gastric cancer treatment that involves participation of a variety of experts incorporating gastroenterologists, gastric surgeons, oncologists, radiation oncologists and others (19).

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## Footnote

*Conflicts of Interest:* The author has no conflicts of interest to declare.

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