Gastric Cancer: An Epidemiological Overview

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Abstract

Gastric cancer constitutes one of the leading causes of cancer incidence and mortality in the worldwide despite its decline over the past century. In this article we will first review descriptive epidemiology of gastric cancer. Next we will discuss its precursors and risk factors; the principal risk factors of stomach cancer are HP Infection, smoking, high salt intake and genetic factors. Finally we will discuss screening strategies and prevention of gastric cancer.

Key words:

Stomach; Cancer; Epidemiology; *Helicobacter pylori*

Introduction

The first statistical analysis of stomach cancer incidence and mortality was in Italy, in the 18s century. This analysis has shown that gastric cancer was the most common and lethal cancer [1]. Since then, stomach cancer remains one of the leadings causes of cancer incidence and mortality.

Epidemiology of stomach cancer varies depending on several parameters including demographic, histological and geographic features. On the other hand, the measures of the associations of gastric cancer with putative risk factors are relatively robust with regard to these variations.

Descriptive Epidemiology of Gastric Cancer

Incidence

Stomach cancer represents the fifth most common malignancy in the world, after lung, breast, colorectal and prostate cancers. In 2012, almost 952,000 cases new cases of gastric cancer were estimated to have occurred in the world (6.8% of all cancer localizations) [2].

In the USA, according to the 2011 SEER data, the prevalence of gastric cancer was estimated at 74,035 cases. The number of new patients diagnosed with stomach cancer was 7.5 per 100,000 men and women per year. Thus, stomach cancer represents 1.3% of all new cancer cases in the U.S [3].

Lifetime risk of developing stomach cancer: About 0.9 % of men and women in USA will be diagnosed with gastric cancer at some point of their lifetime [3].

Mortality

Stomach cancer represents the third cause of cancer death in the world (723,000 deaths). It accounts for 8.8% of all cancer deaths [2]. In the USA, according to the SEER data, the number of deaths was 3.5 per 100,000 men and women per year [3].

Secular trends

Incidence of gastric cancer has declined over the recent decades worldwide (49,510). This is may be due to the recognition of the HP infection role in the carcinogenesis of gastric cancer and the importance of its eradication [1,4].

In the USA, incidence rates have been falling on average 1.5% each year over the last 10 years. Death rates have been falling on average 3.0% each year over 2002-2011 [3].

Regarding gastric cancer mortality rate, a study concluded to an annual percent change in gastric mortality rate around 3%-4% [5].

Geographical variations and ethnicity

More than 70% of gastric cancer cases occur in developing countries (677,000 cases), and half the world total occurs in Eastern Asia (mainly in China) [2]. A difference in incidence and mortality from north to south has been observed in several countries, with the northern areas having a higher mortality risk than those in the south [1,6]. In Japan for instance, gastric cancer mortality and incidence are higher in the northeastern prefectures [7].

In the United States, gastric cancer incidence is increased in Black, Hispanic and Asian than in non-Hispanic whites [3].

Demographical variations

Age: Based on the GLOBOCAN data base, the age-standardised gastric cancer incidence rates per 100,000 per

age standardized incidence rates ranges from 3.3 in Western Africa to 35.4 in Eastern Asia for men and from 2.6 in Western Africa to 13.8 in Eastern Asia for women [2].

In the USA, the age standardized incidence rates ranges from 10.3 in men to 5.3 cases per 100000 persons in women [3].

Distribution of histologic types

The Intestinal gastric cancer occurs more frequently in males and older age groups. It is more prevalent in high-risk areas and is probably associated to environmental factors.

The diffuse or infiltrative type is equally frequent in both sexes. It occurs mainly in younger age groups, and is correlated to the worse prognosis [1].

The incidence of the intestinal type was declining worldwide in recent few decades. On the other hand, the decline in the diffuse type has been more gradual. Consequently, the diffuse type represents about 30 percent of gastric carcinoma [8].

Distribution by stage

In the USA, 25.7% of gastric cancers are diagnosed at the local stage whereas 29% and 35% are diagnosed at the regional and distal stages respectively [3].

Precursor Lesions for Gastric Cancers (Mainly Intestinal Gastric Cancers)

The typical model of gastric cancer carcinogenesis describes a progression from chronic gastritis to chronic atrophic gastritis, to intestinal metaplasia, dysplasia, then adenocarcinoma [9,10].

Atrophic gastritis

Atrophic gastritis is associated with an increased risk of gastric adenocarcinomas with a magnitude of the relative risk ranging from 3 to 18.

females and 1.73 (95% CI=1.06-2.83) in males. T e magnitude of this association increases with duration and intensity of smoking [22].

Alcohol

Data are inconsistent regarding the role of alcohol as a risk factor of gastric cancer [23].

Occupational exposures

Working in the coal, metal, and rubber industries increases the risk of gastric cancer [9,24].

Socioeconomic status

Data from epidemiology studies suggest an increased distal gastric cancer in low socioeconomic population whereas risk of proximal gastric cancers was higher in higher socioeconomic population [25].

Gastric surgery

T e association between gastric cancer and gastric surgery was suggested by 2 meta-analyses concluding to an estimated relative risk ranging from 1.5 to 3.0 [26,27].

Abdominal irradiation

members who have had stomach cancer suggests that they might be at risk for having hereditary diffuse gastric cancer syndrome.

If the genetic testing in these cases shows the person has a CDH1 gene mutation total gastrectomy may reduce the risk of gastric cancer [36].

Screening

The American guidelines do not recommend a routine screening for gastric cancer. However, in some countries with a high gastric cancer burden, screening programs are already implemented.

Screening recommendations for specific groups of patients

Gastric epithelial polyps: Polyps have to be endoscopically excised whenever feasible. When the endoscopic polypectomy is not possible, a

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