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GASTRITIS PREVALENCE AND PRESENCE OF*HELICOBACTER PYLORI* IN A CITY IN THE NORTH OF PARANA STATE, BRAZIL

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ABSTRACT

Helicobacter pylori (HP) is a gastric spiral-shaped bacterium reported in humans more than one century ago. It is a fastidious bacterium that shows high motility easy penetration into the mucosa of the stomach. It is considered the major cause of gastric diseases, especially gastritis and peptic ulcers. If these conditions are not treated can evolve into some types of gastric cancer. For these reasons, this study aimed to evaluate the prevalence of this microorganism in a city from Parana State, Brazil. This retrospective study was carried out at a Medical Unit. Almost 500 Medical charts were analyzed, and 120 medical records of patients with gastritis and peptic ulcers submitted to the Upper Digestive Endoscopy examination were selected. During the examination, fragments of the gastric mucosa were collected to perform the urease test. Our results showed that there was a higher prevalence of HP in patients aged 36-75 years and gastritis is more prevalent in patients with HP. All the patients with peptic ulcer were positive for this bacterium. It is known that HP plays a critical role in the induction of gastrointestinal diseases such as peptic ulcers, and gastric cancer. Furthermore, many epidemiological studies also showed that patients infected with this bacterium showed the growing incidence of gastric carcinoma. For these reasons, studies showing the prevalence of this infection may help in the treatment and prevention of complications that may result from HP infection.

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INTRODUCTION

The presence of *Helicobacter pylori* (*HP*), a spiral-shaped bacterium in humans was reported more than one century ago. It is a gram-negative, microaerophilic and fastidious bacterium and shows high motility due to the presence of helix flagella, leading to easily penetration into the mucosa of the stomach (Okuno *et al.,* 2019; Fagoone, Pellicano, 2019). The pathogenicity of this microorganism is dependent on the ability to colonize and to survive in the gastric environment. Furthermore, the HP genome shows continuous modifications in the host (Elsebaey *et al*, 2019; Fagoone, Pellicano, 2019).Due to geographical distribution and host ethnicity, sex, and socio-economic factors, the prevalence of infections by *HP*isprofoundly variable. There is an estimation that this organism infects about half of the global population. This estimative is corroborated by the fact that the ratio of this infection is significantly lower in the developed countries (Borges *et al*, 2019; Hunt *et al*, 2011).The prevalence of HP in Brazilmay reach up to 90% in impoverished areas. These rates are higher in older populations and specific regions, confirming that economic factor and hygiene conditions are risk factors infection (Basílio *et al*, 2018; Toscano *et al*, 2018).The precise transmission of HP is still a controversy but, once it colonizes the gastric mucosa, authors suggest that the infection may occur through the routes oral-oral, gastro-oral,

fecal-oral or due to zoonotic transmission (domestic flies exhibit zoonotic potential to this kind of transmission) (Altun *et al*, 2019; Borges *et al*, 2019). Infection by HP is initially observed in children and remains typically asymptomatic until adulthood when it provokes abdominal pain, gastrointestinal bleeding, and anorexia. It is related with mild to moderate gastritis, gastroenteritis and peptic ulcer (Levenstein *et al*, 2015; Eusebi *et al*, 2014; Zhu *et al*, 2013). HP is considered the primary cause of gastric diseases, especially gastritis and peptic ulcers that, if untreated, can evolve into some types of gastric cancer and can be regarded as a major public health problem. For these reasons, this study aimed to evaluate the prevalence of this microorganism in a city from Parana State.

MATERIALS AND METHODS

This study is retrospective and was carried out at a Medical Unit, located in the city of Ibaiti-Paraná State-Brazil, after approval by the Committee of Ethics in Research in Human Beings of the City of Assis, SP - Brazil (protocol number 520/2012).A total of 480 medical charts were analyzed from September 2011 to September 2012. Data from 120 medical records of patients with gastritis and peptic ulcers submitted to the Upper Digestive Endoscopy examination were selected. During the examination, fragments of the gastric mucosa were collected and conditioned in a urease test.We collected data for age, housing, diagnosis for gastritis, ulcers, and HP positive or negative.

RESULTS AND DISCUSSION

Invasive or non-invasive methods can make the diagnosis of HP. The invasive ones are made from a sample of gastric biopsies obtained by endoscopy, urease gastric tissue research, histopathological study, culture and the noninvasive breath test, and serological diagnosis. The human being is the main reservoir of HP and has not yet been found in animals that serve as significant reservoirs. The infection is not self-limited and can persist for many years. Environmental reservoirs may also exist, and contaminated waters are important sources in certain areas (Vesga *et al*, 2019). Our results showed that there was a higher prevalence of HP in patients aged 36-75 years (62.5%). According to the literature, studies indicate that the prevalence of gastritis associated with this bacterium is high in developing countries, observing an increase in frequency with age (Borges *et al*, 2019; Trabulsi, Alterthum, 2005).

Of the medical records evaluated, 60 patients were from urban areas and 60 from rural areas, aged between 15 and 75 years with diagnoses of gastritis and peptic ulcers (Table 1).According to Coelho *et al* (2010), the prevalence of HP is high in developing countries; and may vary within the same country in urban and rural populations. The reasons for these variations are poor eating habits, unhealthy foods that attack the gastric mucosa associated with lack of basic sanitation, hygiene, and agglomerations of people. In our results, we observed that gastritis is more prevalent in patients with HP and all the patients with peptic ulcer were positive for this bacterium (Table 2). Coelho *et al*. (2010) reported the prevalence of 75 to 95% of HP in patients with peptic ulcers. The prevalence may vary from different region, family history, genetic factors, and the intake of anti-inflammatory drugs that may warrant the onset of peptic ulcers. Furthermore, *it is known that HP* plays a critical role in the induction of gastrointestinal diseases such as peptic ulcers, and gastric cancer.

Table 1. HP infection according to the urban or rural area

Area	HP positive	HP negative
Urbanarea	71.6% (n=43)	71.6% (n=17)
Rural area	56.6% (n=34)	43.3% (n=26)

Table 2. Presence of gastritis according to the presence of HP infection

Condition	HP positive	HP negative
Gastritis	72.6% (n=69)	27.4% (n=26)
PepticUlcer	100% (n=25)	0

Moreover, many epidemiological studies also showed that patients infected with this bacterium showed a growing incidence of gastric carcinoma (Pokrel *et al*, 2019; Moss, Malfertheiner, 2007). Studies indicate the prevalence of HP in gastritis, ranging from 60 to 95% of the cases. Other factors are also considered essential for the development of gastritis. The use of alcoholic beverages, substances contained in tobacco and some foods can injure the gastric epithelium favoring infection. In developing countries such as Nepal, the HP prevalence is remarkable higher in the number of gastric ulcers, duodenal ulcer, and gastritis (Bello *et al*, 2018; Agbor *et al*, 2018, Thapa *et al*, 2013). Currently, the number of dyspeptic patients has been increasing, becoming a worldwide public health problem. HP infection is a significant cause of these symptoms. Its discovery in 1982 has revolutionized the concepts of stomach diseases. In developed countries, the rate of infected young people is low, prevailing in people over 50 years of age. In underdeveloped countries, infection occurs earlier, involving children under two years of age with low socioeconomic status (Xu *et al*, 2019; Maleki *et al*, 2019; Borges *et al*. 2019). According to Kapadia (1997) in the early 1990s the first work on this bacterial transmission was published. The isolation of HP occurred in feces of infected adults and children in the Gambia. Further studies showed that the bacterium is adapted in the passage from the stomach to the duodenum, which indicates that the bile has no lethal effect for the bacterium, whose survival becomes common. The stomach mucosa contains cells that secrete gastric juice containing enzymes; other specialized cells produce a mucus layer that protects the stomach from digestion. Only with the breakdown of this defense happens the inflammation of the stomach. HP delivers an immense amount of urea, which converts it to an alkaline ammonium compound, resulting in a high pH in the growing area (Elsebaey *et al*, 2019).

Conclusion

Our study investigated the prevalence of HP in patients undergoing high digestive endoscopy through the urease test and results showed that most of the patients had gastritis and all those who had peptic ulcers were positive for the presence of HP. For these reasons, studies showing the prevalence of this infection may help in the treatment and prevention of complications that may result from HP infection.

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