AN OVERVIEW HELICOBACTER PYLORI DIAGNOSIS ROLES OF FAMILY PHYSICIANS AND CLINICAL LABORATORY AS WELL ROLE OF PHARMACIST AND DIETITIAN IN MANAGEMENT

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Abstract:
Helicobacter pylori (H. pylori) infection, which impacts almost 50% of the global population, continues to be a significant public health concern. Early detection and treatment of H. pylori infection are essential in preventing the dissemination of the infection, as it can cause various stomach disorders such as inflammation, gastroduodenal ulcers, and cancers. A clinic dedicated to assessing H. pylori allowed pharmacists to take on a primary care responsibility, record advancements in patient results, and examine the efficacy of different antimicrobial treatment plans. The role of family physicians, along with clinical laboratories and dietitians, in the management of H. pylori is extremely crucial.

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Introdcution:

A highly mobile, gram-negative, and uniquely twisted bacterium known as Helicobacter pylori (H. pylori) was discovered to be present in the gastrointestinal tract for the very first time in the late nineteenth century [1]. Helicobacter pylori (Hp) infection was discovered for the first time in the 1980s by Dr. Barry Marshall and Dr. Robin Warren in gastric biopsy samples taken from individuals who were suffering from peptic ulcer conditions [1]. It wasn't until the 1990s that the scientific community came to the conclusion that there is a connection between Hp infection and peptic ulcers [2]. Two thirds of the population that lives in underdeveloped nations is affected by this virus, whereas around thirty to forty percent of the population that lives in industrially developed countries is affected by it [3]. In most cases, chronic active gastroenteritis is linked to H. pylori, and the bacteria that causes this condition dwells in the glands that are located beneath the mucosal surface [3]. Stomach cancer, peptic ulcer disease, and gastric mucosal lymphoid tissue lymphoma are all significantly linked to H. pylori infection [3]. This is a substantial linkage between the three conditions. A study that was carried out in the past revealed that an infection with H. pylori might lead to the development of mucosa-associated lymphoid tissue lymphoma and stomach cancer in ninety percent of instances. When it comes to stomach ulcers and duodenal ulcers, H. pylori infection is intimately associated with both of these conditions. H. pylori infection is also closely linked to duodenal ulcers, stomach ulcers, and carcinomas [4]. This is because of the intimate interaction between these three conditions. The World Health Organization (WHO) encouraged the elimination of H. pylori as part of its recommendations for 2014, with the goal of reducing the number of people who pass away from stomach cancer all over the world. Bacterial strains of H. pylori that are resistant to clarithromycin are one of the major dangers that could be posed to both human health and the environment [5].

Review:

An infection caused by H. pylori can be broken down into three distinct stages: the colonization of the stomach mucosa, the immunological response that immediately follows, and the development of the disease. In order to take advantage of portions of the stomach wall that have been damaged, the bacterium will float in the direction of the epithelial membrane as it enters the stomach [6]. For the purpose of regulating flagellar motion in response to chemical messengers in the surrounding environment, it makes use of Tlp receptors, primarily TlpB. These receptors receive signals from reactive oxygen species, as well as urea, gastric acid, lactate, and gastric acid; urea is an important factor in the invasion of microorganisms [7]. Moreover, there are chemicals that are not yet known to exist that might be involved in this pathway [7]. As a means of protecting itself from the acidic environment that surrounds it, H. pylori employs urease. Urease is responsible for the conversion of urea into ammonia and other useful compounds. This process elevates the pH of the microenvironment while simultaneously shielding the bacterium from the acid that is produced in the stomach. Because of the presence of this barrier, the mucosal gel that lines the stomach wall becomes less viscous. This makes it possible for the bacteria to move through the mucus and eventually colonize the gastric pits, which they will finally colonize [8].

When it comes to the treatment of HP infection, general practitioners are the first line of therapy that physicians provide. Israel has been the location of two studies that have been carried out in order to evaluate the knowledge and practices of general practitioners. The indication that patients with peptic ulcers should be screened for Hp is satisfied by general practitioners and specialists 95% of the time. On the other hand, only 25–30% of general practitioners screening first-degree relatives of patients who have had stomach cancer for Hp [9]. Despite the recommendations, only 14% of general practitioners look for hypertension in patients who are going to be treated with nonsteroidal anti-inflammatory drugs (NSAIDs) for an extended period of time. On the other hand, according to the recommendations [9], one third of general practitioners are likely to screen for hypertension in patients who have active GERD symptoms. This is contrary to the recommendations. It is estimated that sixty to ninety-seven percent of general practitioners favor the urea breath test as a diagnostic tool. To put it into perspective, just forty percent of patients halt the essential treatments fourteen days before the breath test, as is suggested. A stool antigen test, which is the other gold standard, is only used by 2%–5% of people. When it comes to effective treatment methods, the triple therapy consisting of amoxicillin, clarithromycin, and PPI is by far the most frequently utilized first-line treatment by general practitioners (75–85%). On the other hand, the duration of treatment was fewer than 14 days in seventy percent of the cases. It is estimated that forty percent of general practitioners in Israel

would recommend concurrent therapy as a secondary treatment option, while thirty percent would choose bismuth quadruple therapy [10]. Last but not least, the findings demonstrated that a non-invasive test is used by just sixteen to forty percent of general practitioners to establish the complete elimination of an infection. There may be disparities in health care systems, epidemiology, and methods to the management of Hp infection in different regions, which may be the cause of the disparity in management that is observed among primary care physicians all over the world [11].

Medical specialists were responsible for writing the majority of the recommendations in order to unify the care of HP infection. It was agreed upon by primary care practitioners that they would adhere to these suggestions [11]. When it comes to suggestions, the Maastricht recommendations are the most well-known. The first of these in 1997. In 1999, interviews were conducted with general practitioners and experts in a number of European nations in order to assess the impact of the Maastricht proposals. After doing research, it was shown that around fifty percent of medical professionals were aware of the Maastricht criteria. The majority of primary care practitioners are in agreement that they will adhere to these recommendations, and they would also believe that the knowledge and suggestions concerning the management of hypertension are beneficial to their practice [7]. On the other hand, primary care practices continue to be diverse. Two studies conducted in Israel have demonstrated that there is a disparity in the manner in which general practitioners and specialists carry out the execution of the Maastricht principles from the year 2000. Shirin's research from 2004 demonstrated that gastroenterologists and internists were more effective in applying the recommendations made at the Maastricht conference in 2000 than general practitioners were. This was especially true with regard to the significance of detecting and eliminating Hp in cases of malignant gastric lesions or the use of nonsteroidal anti-inflammatory drugs (NSAIDs) [11]. According to the findings of the other study that Boltin carried out in 2016, there is a gap in the practices that general practitioners engage in, with the suggestions being applied more effectively in urban regions than in rural areas [12]. A reduction in the heterogeneity of practices could be achieved through the implementation of information campaigns. These campaigns could focus on the indications for HP screening, the practical procedures for carrying out non-invasive tests, and the updating of first- and second-line treatments in accordance with the specific epidemiology of the region [12]. In order to reduce the amount of resources that are wasted on medical care and to improve the effectiveness of patient management, general practitioners would like to be provided with additional educational programs on the management of heart disease infection. In point of fact, inadequate follow-up of these recommendations in primary care has a tendency to have an impact on the efficacy of the therapies that are recommended, as seen by the rise in clarithromycin resistance over the past ten years and the decline in the elimination of Hp that has occurred. For instance, a study conducted in Israel by Boltin in 2016 revealed that 38 percent of general practitioners would employ concurrent therapy, and six percent would later administer the same treatment if it was unsuccessful. Furthermore, despite the recommendations, the majority of prescribers of triple therapy consisting of amoxicillin, clarithromycin, and PPI urge that the treatment be administered for a duration of fewer than 14 days. Nevertheless, in 2013, a meta-analysis conducted by Cochrane that included 75 randomized clinical studies discovered that extending the duration of clarithromycin triple therapy from seven to fourteen days resulted in a significant increase in the percentage of Hp that was eradicated (72 to 81.9%) and a reduction in the probability of treatment failure (relative risk 0.66, confidence interval 95 percent) Due to the fact that recommendations are not being implemented, the cost of care and the level of bacterial resistance have both grown [12].

Following the failure of two lines of treatment, European standards suggest that a specialist be consulted in order to discover the source of Hp resistance to antibiotics by completing an antimicrobial susceptibility testing [13]. This is done in order to determine the source of the resistance.

Performing a screening for Hp infection is essential in order to reduce the risk of developing stomach cancer. It is not suggested to do population-based screening in nations where the frequency of HP is low to begin with. Targeted screening is indicated for patients who are under the age of 45, do not have a history of stomach cancer in their family, and present with symptoms of dyspepsia without any warning indications. This kind of individual screening is doable in primary care, particularly due to the fact that general practitioners are frequently and primarily exposed to the group that is being targeted. On the other hand, it is recommended to refer patients who have

symptoms of dyspepsia to gastroenterologists, patients who are over the age of 45 and have symptoms of dyspepsia, and patients who have warning signals regardless of their age. The goal of this advice is to identify pre-neoplastic lesions. Compared to the other approaches, the sensitivity and specificity of the first-generation serological tests were significantly lower, ranging from approximately 79–85% [14]. Based on the findings of the research conducted by Burucoa et al. and published in Helicobacter in June 2013 [15], it is evident that serological tests of the second generation currently exhibit satisfactory performance, with sensitivity and specificity levels over 90%. In the time since this research was published, the authors have advocated for the use of serology in the diagnostic process, and the Haute Autorité de Santé (HAS) in France has incorporated it into its diagnostic algorithm. There is no modification caused by PPI or antibiotics, which is one of the advantages of this test [15].

Conclusion:

Helicobacter pylori infects the stomachs of more than 50% of the global human population, making it potentially one of the most thriving bacterial infections. The efficacy of treatment in eliminating Helicobacter pylori, a gastrointestinal infection, ranges from 70% to 90% in clinical trials, but is comparatively lower in real-world scenarios. Possible obstacles may arise from the intricacy of a multiple treatment plan or problems in prescribing or administering medication. To overcome these obstacles and improve treatment results, a service was established where pharmacists manage the treatment of H pylori. The clinical pharmacist offered two distinct services: (1) providing education and monitoring for patients who are new to therapy, and (2) initiating treatment, providing education, and monitoring for patients who had prior experience with treatment. Helicobacter pylori is a bacterium that belongs to the Epsilonproteobacteria class and has a Gram-negative cell wall structure. More than half of the world's human population is infested by H. pylori, a bacterium that lives in the stomach of humans and is typically acquired at a young age. Moreover, there is compelling evidence suggesting that H. pylori has successfully established itself in human hosts and undergone coevolution for a minimum of one thousand centuries.

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