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The Study of *Helicobacter Pylori* Bacteria Infection in Bani Waleed city - Libya

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ABSTRACT

The current study included 430 infected cases with *H. pylori* bacteria in Bani Waleed city, Libya. Risk factors that might have an important role in an increasing the risk of infection were studied such as drinking stimulants tea and coffee, and smoking. The samples were blood and faces and were tested using rapid test to find the infection. The percentage of infected people who drank both or one of the stimulants was 74%. Most of infected cases were young people between the ages of 25 to 36 years, with an infection rate of 35%. The study also showed that eating spices increased the risk of infection to 64%, however infection rate among men was higher than women at a rate of 55%, while the infection rate among women was 45%. On the other hand, study showed that the smoking was not significant, as 56% for smokers were infected, Also, the study indicated that there is no link between *H. pylori* infection and chronic diseases such as diabetes and blood pressure, as the results showed that 76% of the infected people do not suffer from any chronic diseases. It was also found that the two blood groups A and O are more prevalent among those infected with *H. pylori* bacteria, with a percentage of 31% for both types, followed by blood group B, with 26%, then blood group AB at 12%. More studies should be carried out to establish the risk factors and set a control plan.

INTRODUCTION

Helicobacter pylori, previously known as *Campylobacter pylori*, is a gram-negative, microaerophilic, spiral bacterium usually found in the stomach [(1)]. The bacterium was first identified in 1982 by the Australian doctors Barry Marshall and Robin Warren [(2.3)].

H. pylori infection usually has no symptoms but sometimes causes gastritis or ulcers of the stomach or first part of the small intestine. The infection is associated with the development of certain cancers [(5)]. *H. pylori* has been associated with cancer of the mucosa-associated lymphoid tissue in the stomach [(4)]. *Helicobacter pylori* is contagious, although the exact route of transmission is not known [(6.7)]. Person-to-person transmission by either the oral–oral (kissing, mouth feeding) or fecal–oral route is most likely. Consistent with these transmission routes, the bacteria have been isolated from feces, saliva, and dental plaque of some infected people [(8)].

In 2015, it was estimated that over 50% of the world population had *H. pylori* in their upper gastrointestinal tracts [(9)] and this infection is more common in developing countries. [(10)]. However, in recent decades, the prevalence of *H. pylori* colonization of the gastrointestinal tract has declined in many countries [(11)]. The association of metabolic sclerosis and the infection of *H. pylori* is still controversial with possible connection between them, however, the high prevalence of both MS and *H. pylori* infection might explain the coincidence [(12)].

A study In El-Beida City, Libya included 181 adult patients that were divided into two groups upon presence and absent of antibodies against to *H. pylori*. The positive rato was 60.7% males, and 81.6% females and the negative rate was 39.3% males and 18.4% females. The highest prevalence with positive *H. pylori* infection was noted in age group between 20-50 years. Overall, 70.166 % were found positive with *H. pylori* in serum examination and 32.6% of cases were positive with *H. pylori* in stool test [(13)]. This work was aimed to investigate the *H. pylori* infection and identify the risk factors that associated with the infection in Bani Walid City, Libya.

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MATERIAL AND METHOD

Study area and samples collection

The study was conducted in Bani Walid city, which is located in the western north of Libya with 120 thousand people. Number of 430 samples were collected during the period from 1/1/2021 to 31/12/2022 in Bani Walid general hospital. the males' samples made up 55% (233), while females were 45% (197). After conducting the required examinations.

H. pylori Ab blood test

Three drops of blood were drawn, which is equivalent to approximately (0.15 ml), and then the sample is placed in a centrifuge at 2500 prm for 10 minutes in order to separate the serum from the blood, and then a serum was taken with a pipette and placed on a rapid test slide to detect IgG antibodies for 5 to 15 minutes to give the result, then the positive result was recorded, which is indicated by the appearance of two dark lines on the test slide.

Stool *H. pylori* Antigen Test

A simple stool sample is taken and placed in the tube attached to the test slides containing the buffer solution, the stool is mixed well with the solution, and then three drops were removed because the buffer solution may did not reach it. Three drops of the well-mixed sample were placed it on stool test slide and after 10 to 15 minutes the positive result will appear by two dark lines on the test slide and infection is recorded.

RESULTS

The study was carried out in Bani Waleed hospital included 430 samples and the results are illustrated in next graphs and tables.

Infection of *H. pylori* according to gender.

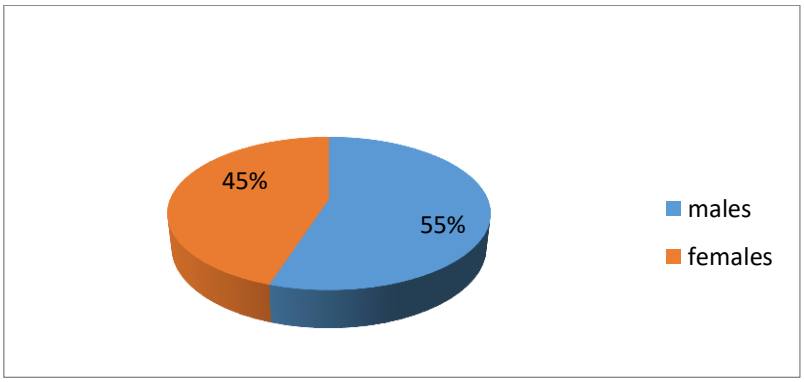


Figure (1) Infection rate of *H.pylori* according to the gender

The figure 1: showed that the percentage of positive cases for males was (55%) of the total cases, while the percentage of infection in females was about 45%.

Infection of *H. pylori* according to the age

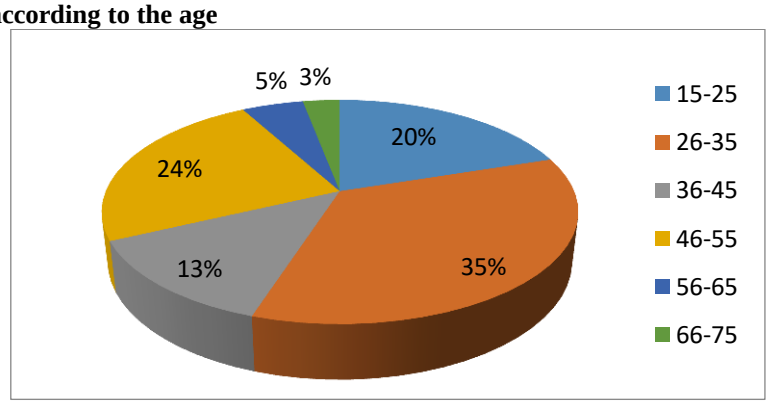


Figure (2) Infection rate of *H. pylori* according to the age.

The figure 2 shows that the age group from 35 to 26 years is the most infected age group with H. pylori, as the percentage of infection rate reached 35%, while the lowest infection rate was at age group 65-75 years old, with 3%.

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Infection of *H. pylori* according to smoking habits

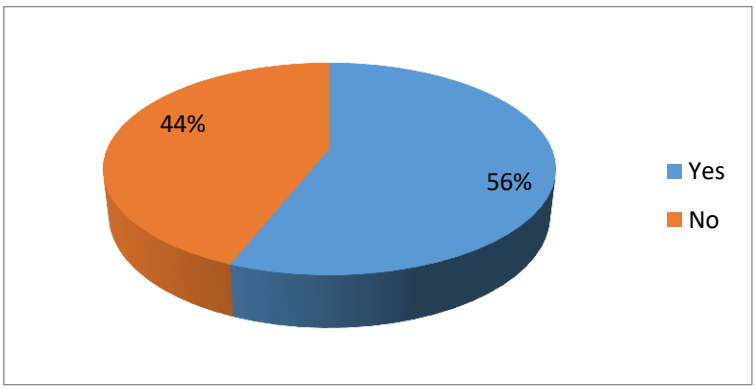


Figure (3) Infection rate of H.pylori according to smoking factor.

The study has found that infection with *H. pylori* in smokers more prevalent than non-smokers as it was at 56%, compared to non-smokers with 44%.

Infection rate of *H. pylori* according to presence of chronic diseases

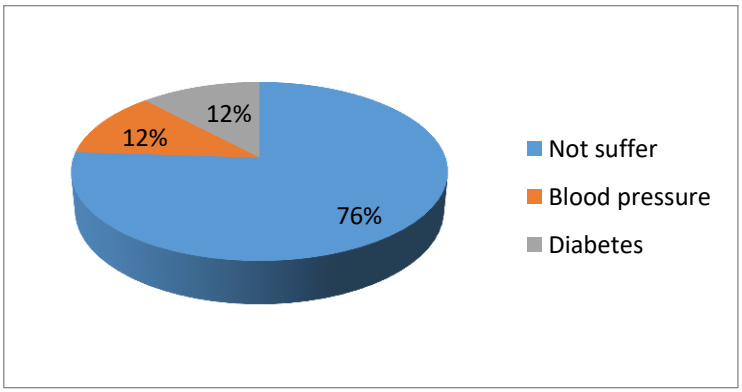


Figure (4) Infection rate of *H. pylori* according to presence of chronic diseases

Figure 4, showed that there was no correlation between *H. pylori* infection and diabetes or blood pressure, as the rate of infection only at 12% comparing to healthy people 76%.

Infection rate of *H. pylori* according to eating habits

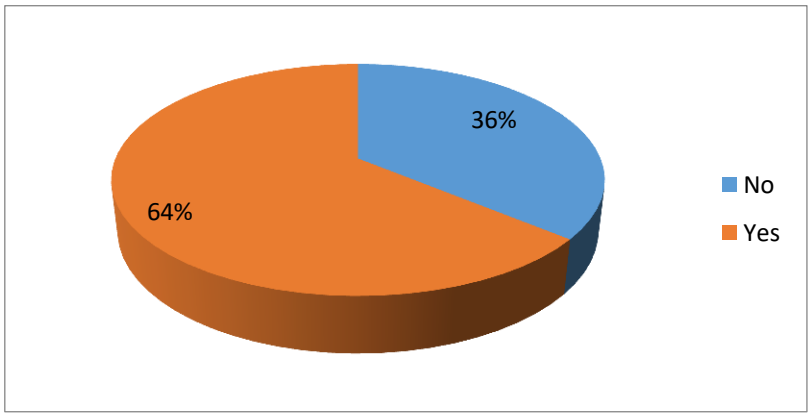


Figure (5) shows Infection rate of *H. pylori* according to consuming spices.

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The results indicated there is a correlation between the infection rate and eating spicy food which, was about 64%, and the percentage of people who avoid spices in their food was 36%.

Infection rate of *H. pylori* according to drinking stimulants

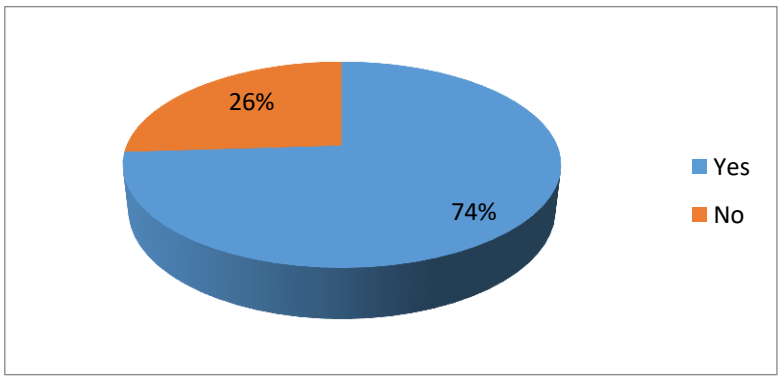


Figure (6) shows Infection rate of *H. pylori* according to drinking stimulants.

Figure 6, showed that there is a relationship between H. pylori infection and drinking stimulants, as the rate of infected people who drunk stimulants was 74%, while the infected people who did not drink stimulants was 26%.

Infection rate of *H. pylori* according to blood group types.

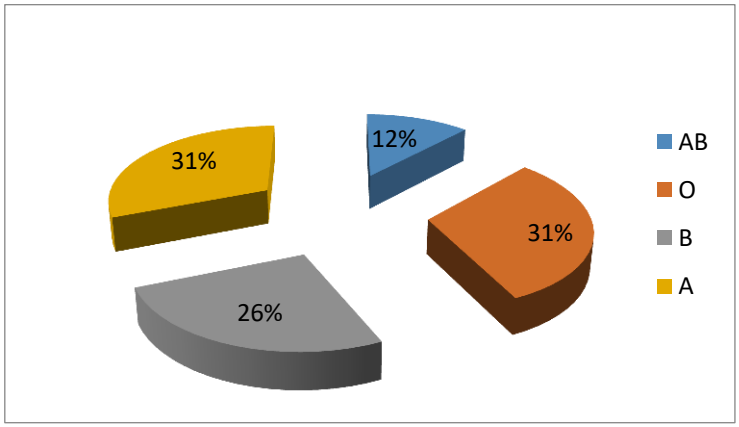


Figure (7) shows Infection rate of H.pylori according to blood type

The figure 7, indicated that blood groups A and O are more prevalent among those infected with *H. pylori* bacteria, with a percentage of 31% for both types, followed by blood group B, with a percentage of 26%, then blood group AB, at 12%.

DISCUSSION

The study included 430 samples and has found about 204 positive samples with *H. pylori* bacteria during the period from 1/1/2021 to 30/12/2022, that were diagnosed using a rapid blood test to detect IgG antibodies to bacterial infection, and a rapid test of stool samples to detect antigens for *H. Pylori* and also investigated some risk factors that may have a role in increasing the rate of infection with bacteria, such as age. The study has showed that the age group 35-26 years is the most infected with *H. pylori* at rate of 35%, followed by the age group 55- 46 years with a rate of 24%, and then age group of 15- 25 with a rate of 20% and then the age group 45-36 years old, with a rate of 13%. These results show that youth, and people under the age of fifty years old are most susceptible to infection with *H. pylori*, which, could be due to their habits such as smokers and eating spicy food [(14)]. The age groups over 50 years old had a low infection rate, as the infection rate was decreased such as in the age group of 56-65 years and the age group 66-75 years, which was 5% and 3% respectively.

The results of this study were consistent with a previous study that also showed a low incidence of infection among the old age groups [(15)], and this may be explained by one of two theories, either the bacteria are already present, but with small number and low activity to a point that cannot be detected, and therefore the test gives a negative result

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despite its presence because the immune response could not detect the bacteria and therefore did not make antibodies, on other hand, the bacteria could have been present in the past in childhood and youth, but it h disappeared due to the presence of unfavorable environment in older people [15.16]. It is likely that the increase in H. pylori infection in this age group in the youth stage may be due to the increase in the percentage of smokers, as well as an unhealthy diet, and also the role of the gender of the case to increasing the infection rate, as the study showed that males are more susceptible to infection than females, by percentage of 55% for male and 45% for female. this result agreed with a previous study [17] [18]. This is due to the factor of smoking and consumption of stimulants, which are more prevalent among males than females.

Regarding to smoking factor the study agreed with a previous study conducted in the city of Ramadi, Iraq in 2015, where the effect of smoking was very large in that study and reach to 86% of smokers among the total cases [15] , where the current study showed that effect of smoking is not very significant at a rate of 56% of infected smokers and 44% were non-smokers. Also, one of the factors that increase the rate of infection with *H. pylori* is consuming spices, the results showed that 64% among the total of cases eat a lot of spicy food. Spices cause damage to the gastric membrane, and irritations occur in the mucous wall of the stomach, which leads to increased opportunities for bacteria to infect the stomach. [19]

The study showed that people who take stimulants are more likely to be infected with *H. pylori* as 74% among them were infected compared to people who did not take stimulants 26%, because the stimulants cause flatulence in the stomach and the caffeine found in coffee and tea stimulates the production of gastric acids, as the acidity make a good condition suitable for the growth of stomach germs, which increases rate of infection. Among other factors is the relationship between chronic diseases and infection rate, as the current study showed that chronic diseases had no effect of infection rate and concluded there has no correlation with the infection rate, as it was found that only 12% of people suffer from diabetes and 12% had blood pressure were among the cases infected with *H. pylori*. [20]

Finally, regarding the blood type factor and its role to increasing the infection rate, it was found that blood group type O and A are more susceptible to infection with *H pylori* as the rate was 31% for each blood type and then followed by blood type B with a percentage of infection 26% and blood type AB 12%. Previous studies showed that those people with blood type O are more likely to be infected with *H. Pylori* due to gastric acid secretion. The study concluded that *H. pylori* is more susceptible to infection in males than in females and many factors could play a role in spreading the infection in Bani Waleed community. More studies are needed to establish the risk factor for the community and set up a control and prevention plans to reduce the infection rate among all age groups.

CONCLUSIONS

Helicbacter pylori is implicated for the causation of gastrointestinal tract infection including gastric cancer. H.pylori infection rate increases with age ,our study show that youth and people under the age of fifty years okd are most suseptible to infection with H.pylori ,also among the risk factors that increase the infection rate is smoking for men, adding spices to the daily foods, and the sex factor, as our study showed that men are more susceptible to infection than women.

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