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INVESTIGATING THE SPREAD OF HELICOBACTER PYLORI AMONG WORKERS IN THE INDUSTRIAL AREA OF KIRKUK CITY AND ITS RELATION WITH DIABETIC PATIENT AND SMOKERS

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Abstract

The current study included the collection of (158) blood samples from people working in the industrial district of different types and ages, their ages ranged between (12-67) and they were suffering from stomach pain and digestive disorders, and the samples were collected from (June 2021- until the middle of the first month of July 2021), and the sera of people were analyzed to detect antibodies to the bacterium Helicobacter pylori, where the results of the current study showed that (47) blood samples with a percentage (%29.7) were positive for the examination, while (111) blood samples were (%70.3) was negative for the examination, and the current study aimed to determine some of the factors affecting infection with Helicobacter pylori and included the age group, as it reached the highest rate of infection in the group(60-67) at a rate of (29%),while the lowest rate of infection was in the group (19-12). and by (3%), the Results also showed the effect of smoking on those infected with H. pylori bacteria, where the infection rate among smokers was (%61.7), and it was (%58.6) among people who smoke heavily and by (%41.3) among people who smoke a less , in terms of the rate of infection with stomach germs among adults was the percentage of non-smokers was (%38.2), and the study also showed a relationship between infection with Helicobacter pylori and diabetes, where the percentage among people with diabetes reached (%40.4), while the percentage of non-diabetics and

people with germs was (%59.6), and the age groups were most vulnerable to the bacteria from People with diabetes are (60-67) also.

Keywords: Helicobacter pylori, smoking, diabetes, Kirkuk

Introduction

Helicobacter pylori is one of the most bacteria that causes infectious diseases such as stomach inflammation, gastric ulcer, mucoid and lymphatic tissue ulcer with mucous associated lymphoid tissue[1]. H. pylori was first identified in 1983 by Robin Worren and Barry Marshal and is classified as a gram negative bacteria, microaerophilic which lives in the mucosal layer of the stomach and leads to gastric ulcer[2].

After urease production which transform urea to ammonia and change the acidity of stomach from acidic to neutral or alkaline, also it's responsible for stomach acidity resistance. It contains flagella which helps in the adherence and its motility. The mucosal layer of the stomach is protected against bacteria due to its high acidity. However, H.pylori brake this rule because of its ability to attach and penetrate this layer[3]. This ability helps the bacteria to colonise in this tissue. It considers the most bacterial type that transfer from one person to another and spreads the infection. One way for the infection with H. pylori is via eating food infected with this bacteria, vegetable and fruits that is not washed properly[4].

Another way of infection with H. Pylori sharing the nergella (shisha) between people. The infection rate is the highest in the developing countries due to the lack of self-hygiene and low health issues which act a major role in the spread of the infection[5]. Also, this bacteria is considered second cause of chronic bacterial infection in human and about 20% of those infected people develop gastric ulcer whilst others does not show any symptoms[6] [7].

Smoking is one of the most problems that threatens the human wellbeing and the worst thing is that it affect not only the smokers themselves but also other people around them as well[8]. In this regard, researchers showed that smoking has a negative regulation of immune system specially decreases in immunoglobulins IgM and IgG respectively[9] [10].

Sample collection:

In this study about 158 blood samples were collected from people working in the industrial district of Kirkuk city who suffer from stomach ache and digestive system problems. The period of the study was from June 2021 to July 2021. Samples were taken from age group between 12-67 years males. Of those were smokers and non-

smoking people. All experiments were conducted in laboratories of department of biology/ college of science, University of Kirkuk. After blood collection, samples were centrifuged to get serum.

Methods:

1- Onsite H.pylori Ab Combo Rapid test

Cassete method were used as a rapid test to detect IgG antibody. In this method, 70 µl of serum samples were added to the cassette then one drop of the solution was added, then incubated for 15 minutes in room temperature, serums that have antibodies will concentrate in the T zone of the cassette were antigens are located which is inactivated after addition of serum to the wells where antigen-antibody complex form. All steps were performed following manufactures instructions (On site Ltd) [11] [12].

2- H. pylori antigen

Stool samples were collected from those who were IgG positive for H. pylori and its antigen were detected using strips of onsite H.pylori Ag Rapid test cassette[13] [14].

Results and Discussion

The results of the study showed that (47) samples (29.7%) of the total (158) blood samples were infected with H. pylori, while (111) samples (70.3%) were negative for test, and the study showed infection from different age groups and in different percentages The most age group infected with Helicobacter gate if it reached (60-67) by (29%), followed by the group (52-59) and by (21%), while the age group (36-43) and by (13%), t was followed by the age group (28-35) with a percentage of (12%), and the age group (44-51) (20-27) with a percentage of (14%, 8%), respectively), while the age group (12-19) (3%) as In Figure (1), the percentage of infection with H. pylori bacteria was shown at a rate of about (25.5%), despite the appearance of their positive infection, but they had no symptoms, and age is one of the important factors that affect the infection rate [15] where this result was close With the result reported by [16] and it was found that the age group (60-67) is most susceptible to infection with bacteria But it did not agree with the results [17] when they found that the age group (11-20) was the most affected, and it also did not agree with the study that reached the conclusion that young age groups are more susceptible to infection with bacteria, and it also agreed with the study [18] if the elderly age groups found The infection rate was greater, as the study explained, it may be bacteria that are present in a small number and have low activity and cannot be detected at an early stage of life, and infections

may increase in more elderly groups due to the enhanced intestinal micro-environmental [19].

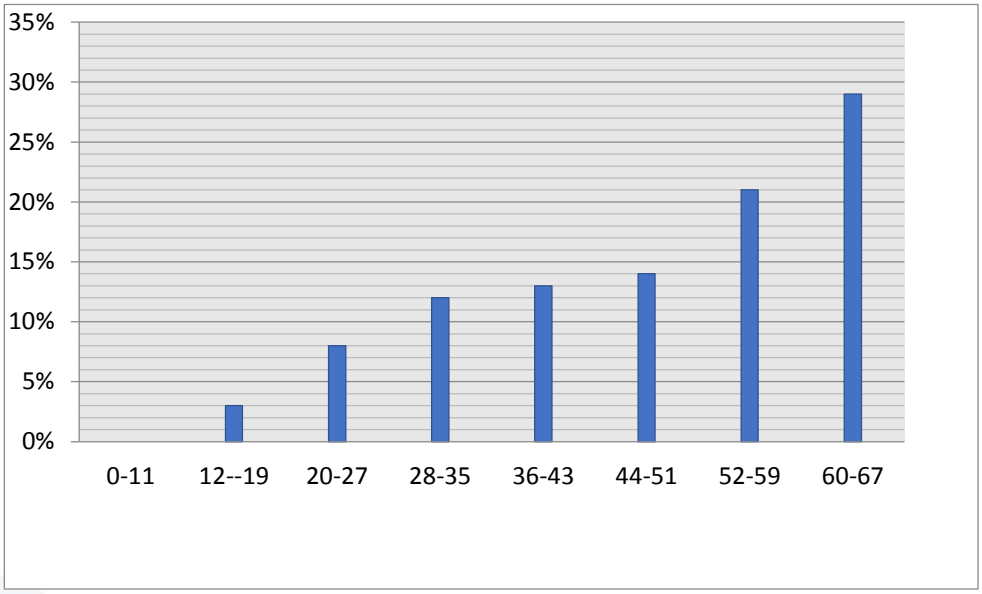

Figure 1: Percentage of H. pylori infection by age groups.

As for the effect of smoking on infection with H. pylori bacteria, the current study showed that the rate of infection with stomach bacteria among smokers amounted to 29 and a percentage of (61.7%) out of the total 47 infection and in different age groups, and it was at a rate of (58.6%) among people who smoked with a rate of (41.3%) among people who smoke a little, where the rate of infection with stomach germs among non-smokers was (38.3%), as shown in Table (1) and Figure 2.

Table (1) shows the percentage of the number of stomach germs among smokers and non-smokers

Percentages %	NO	H.pylori infected
%58.6	17	Heavy smokers
%41.4	12	Smokers with medial level
%38.2	18	No smoking
%29.7	47	Total

These result is in agreement with the results of the study [20], Where the infection rate in smokers reached (86%). Smoking is considered a harmful factor to the stomach as it weakens the immune system, as smoking reduces the immune response against H. pylori bacteria [21] by reducing the levels of antibodies in the body. The serum against these bacteria was observed that these antibodies decreased in a study conducted on gastric ulcers [22].

Nicotine reduces the levels of IgG, IgM, and IgA antibodies in gastric fluid as well as in serum [23]. Epidemiological studies have shown that smokers are the most vulnerable group to developing gastric ulcers. Used by smokers, the effect of smoking in the stomach appears by increasing the secretion of gastric acid. [24] It should be noted that smoking destroys the protective mechanism of the gastric mucosa due to the presence of nicotine in cigarettes that stimulates increased secretion of HCL, which causes erosion of the stomach lining containing cigarettes in addition to Nicotine contains carbon monoxide (CO), which reduces mitochondrial cellular respiration For gastric tissue cells as a result of the increased bonding of carbon monoxide with hemoglobin in the blood, and thus the death of cells of the stomach increases as a result of the decrease in the percentage of oxygen reaching those cells in the digestive tract, and thus the gastric ulcer increases [25] [26].

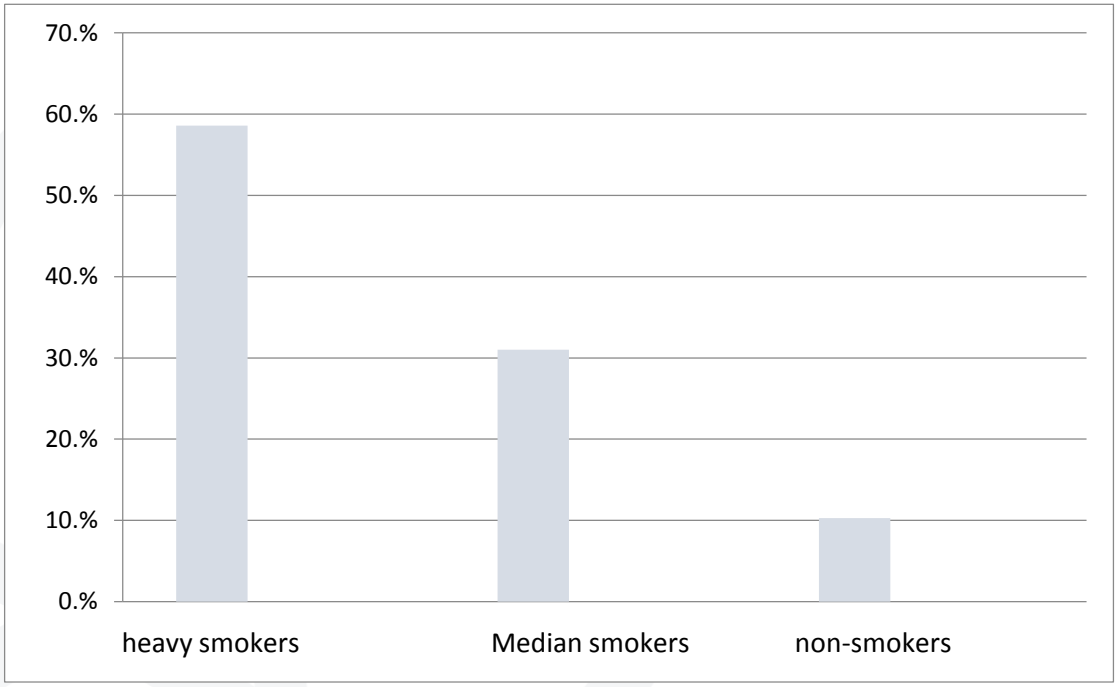

Figure 2: Percentages of H. pylori infections among smokers and non-smokers.

Study of the relationship between diabetes (type II) and infection with the bacteria H. pylori

The results of the current study showed that there was a relationship between infection with H. pylori and the incidence of diabetes, where the results that were reached from people with stomach germs and who have diabetes, their percentage reached (40.4%). As for the non-diabetics and those with bacteria (59.6%), The most age groups susceptible to infection with the bacteria are (60-67), as shown in Table (2) showing the percentage of the number of H. pylori infections among diabetics

and non-diabetics. And these results were close to the results found by the researcher [28], where the results showed that the percentage of people with stomach germs and they have diabetes was (37.3%), while those with stomach germs and non-diabetic people was (35.2%). A study indicated that infection with H. pylori raises the levels of glycated hemoglobin HbA1c, which is one of the signs of high levels of glucose and diabetes, and researchers also believe that this bacteria reduces the level of two stomach hormones that regulate glucose levels in the blood [29]. As well as studies confirming the results that have been reached, people at risk of developing diabetes should carry out periodic medical tests for stomach germs [30]. As well as diabetes, it causes a decrease in intestinal motility and the secretion of gastric enzymes, and this may encourage colonization of the bacteria and increase the chance of infection. People with diabetes may reduce their cellular and humoral immunity, and this may lead to exposure to H. pylori infection [31].

Table (2) shows the percentage of H. pylori infections among diabetics and non-diabetics

H .pylori status								
Age	Diabetics				Non-Diabetics			
	Positive		Negative		Positive		Negative	
	NO	%	NO	%	NO	%	NO	%
12-19	1	%5.2	1	%3	1	%3.5	23	%30.6
20-27	1	%5.2	1	%3	3	%10.7	19	%25.3
28-35	2	%10.5	3	%9	3	%10.7	13	%17.3
36-43	2	%10.5	2	%6	4	%14.2	10	%13.3
44-51	3	%15.7	5	%15.1	3	%10.7	5	%6.6
52-59	4	%21.1	9	%27.2	6	%21.4	2	%2.6
60-67	6	%31.5	12	%36.3	8	%28.5	5	%4
Total	19	%40.4	33	%29.7	28	%59.6	78	%70.3

In Conclusion

The current study showed that elderly people are more susceptible to h. pylori than other age group factors that increase the risk of gastric ulcer caused by h. pylori are smoking in which heavy smokers recorded the most percentages of infection diabetes as well increased the rate of infection with h. pylori in both factors workers were under the risk of developing gastric ulcer There for we suggest more studies in this regard in order to tackle this problem and save workers health.

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