Polytechnic Journal

Polytechnic Journal

Volume 12 | Issue 1 Article 3

12-1-2019

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How to Cite This Article

housein, zjwan; othman, Goran qader; Ismael, Hawro dlawar; and ali, Beriwan Abdulqadir (2019) "Prevalence and Relationship between Helicobacter pylori infection and Obesity in the Kurdish population," *Polytechnic Journal*: Vol. 12: Iss. 1, Article 3.
DOI: https://doi.org/10.25156/ptj.v12n1y2022.pp16-20

Prevalence and Relationship between Helicobacter pylori infection and Obesity in the Kurdish population

Abstract

Globally obesity is a commonly health condition. A great number of investigators have been studying the association between Helicobacter pylori (H. pylori) infection and obesity. It's also known that H. pylori causes inflammation within the mucosa of the stomach which is known as gastritis. However, due to the arguable data in the literature, the relationship between H. Pylori and obesity remains debatable and there is no comprehensive proof for the association.

Keywords

Accidents, Road, RTAs, Study, Value

Polytechnic Journal. 2022. 12(1): 16-20
ISSN: 2313-5727
http://journals.epu.edu.iq/index.php/polytechnic

POLYTECHNIC JOURNAL

RESEARCH ARTICLE

The Prevalence and Relationship between Helicobacter pylori infection and Obesity in the Kurdish population

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Received: 03 March 2022
Accepted: 10 March 2022
Published: 14 August 2022

DOI
10.25156/ptj.v12n1y2022.pp16-20

ABSTRACT

Background: Globally obesity is a commonly health condition. A great number of investigators have been studying the association between *Helicobacter pylori* (*H. pylori)* infection and obesity. It's also known that *H. pylori* causes inflammation within the mucosa of the stomach which is known as gastritis. However, due to the arguable data in the literature, the relationship between *H. Pylori* and obesity remains debatable and there is no comprehensive proof for the association.

Objective: To study the Prevalence and Relationship between *Helicobacter pylori* infection and Obesity.

Methods: In this study 200 subjects were contributed, including 100 patients positive tested with *H.pylori* and 100 healthy participants with negative serological test for *H. pylori* infection. The data were collected in different places in the Kurdistan region of Iraq including Rizgary Hospital in Erbil and Alaa laboratory in Soran city and other places around Erbil Provence. The body mass index was calculated by measuring the weight in kg and length of participants in cm. Furthermore, all subjects filled in a self-administered questionnaire to collect more detailed data about the subjects. Descriptive and inferential statistics were obtained using statistical analysis programs including SPSS and GraphPad prism.

Results: The prevalence of obesity is significantly higher in *Helicobacter pylori*-positive patients compared to the control in young age persons, and the result showed also that *H. pylori* positive group are consuming significantly more fast food and have a higher BMI compared to control group.

Conclusion: Our result significantly indicates an association between *H. Pylori* infection and overweight/obesity examined in the case-control study in the Kurdish population.

Keywords: Accidents, Road, RTAs, Study, Value.

INTRODUCTION

Obesity is complex health condition that buildup a disproportionate or aberrant fat and adipose tissue in the body that may harm human health (Xu et al., 2017). The discrepancy in daily calorie intake and energy consumption causing unnecessary increase in body weight. In united states of America one fifth of the African Americans are dying due to obesity and therefore it ranks the second most preventable death after smoking and it also threating the society health in entire world (den Hollander et al., 2017, Xu et al., 2019a). According to WHO, overweight and obesity has been doubled since 80's and is expected to grow till it reaches the third of the global population (Chooi et al., 2019) In 2015 WHO announced that around 40 percent of adults older than 18 years old were overweight with slightly higher percentage in men, while obesity rate is higher in women (40%) compared to the men (39%) (Hruby and Hu, 2015a). The frequency rates of overweight and obesity have been increasing rapidly in Western societies as well as the developing world (Kyrou et al., 2018). The alteration in diet that contains more sugar, fat and meat and bigger amount of food as well as drop in physical activities are contributing in developing overweight (Bhurosy and Jeewon, 2014). in the past three decades overweight and obesity were more common in the developed country while the current trend shows a shift toward the developing countries (Xu et al., 2019a, Bhurosy and Jeewon, 2014). According to latest collecting data by WHO in 2016, more than 1.9 billion adults were overweight and 650 million of these overweight people are suffering from obesity (Nuertey et al., 2017). The body mass index (BMI) is currently employed to describe the rate of overweight and obesity and is assessed as weight of the person in kilograms divided by height of the person in meters (Xu et al., 2019a). According to WHO classification. a BMI range between 25-30 indicates overweight, while a BMI higher than 30 indicates that the person is suffering from obesity (Xu et al., 2019a). Multiple factors are involved in developing obesity including biological, genetic,

social, environmental, and behavioral determinants (Lee et al., 2019). Other causes of obesity includes the modern lifestyle; include lack of physical activity, stress, lack of sleep, excessive energy intake, endocrine disorders, medications, and energy metabolism (Panuganti et al., 2021).

Obesity is directly responsible for almost 7% of the overall morbidity and mortality (Hruby and Hu, 2015b). The most common associations are abnormal change in cholesterol and other lipid derivates and developing immunity against insulin, in turn, causing type 2 diabetes (T2DM), stroke, gallstones, joints, muscular disorder, respiratory problems, obesity hypoventilation syndrome, and cancers that eventually influencing their daily activities as well as enhances the chance of death (Pi-Sunyer, 2009, Fruh, 2017, Chen et al., 2018). Some researchers have been reporting a link between Obesity and infection and claim that microorganisms may provoke and enhance in accumulation of adipose tissue. Some examples of these microorganisms are human adenovirus, H1N1/influenza virus, human immunodeficiency virus, and *Helicobacter pylori* (*H. pylori*) (Xu et al., 2017). Lately, several investigators suggested an association between *H. pylori* and obesity (Xu et al., 2019a).

Helicobacter pylorus is a Gram-negative rod/spiral-shaped microaerophilic bacterium (Parikh and Ahlawat, 2021, Kouitcheu Mabeku et al., 2018, 2001). Around 30 years ago *H. Pylori* was for the first time isolated in human stomach and known as gastric colonizer (Xu et al., 2019a). *H. pylori* are one of the bacteria that mostly infecting the epithelial lining of the stomach that causes lifelong infection (Al-Zubaidi et al., 2018, Jeffery et al., 2011). In 2015 around 4.4 billion of the population worldwide were infected and the infection rate is above average in developing countries (93.6%) than in high-income countries (15.5%) (Diaconu et al., 2017, Bravo et al., 2018).

The worldwide incidence of *H. pylori* is 44.3 % and its slightly higher in males (46.3%) compared to females (42.7%) (Zamani et al., 2018). There are several routes whereby *H. Pylori* is transmitted from an individual to other individual. The oral-oral route via saliva is the most prominent way of transmission followed by fecal-oral route (Bravo et al., 2018). The common signs of *H. pylori* infections were nausea (25.5%), followed by pain in upper abdomen (24.5%), and chest pain (20.2%) (Abbas et al., 2018).

There are several way for diagnosing an individual with *H. pylori* infection; the easiest method is using antigen against *H. pylori* in stool specimen, UBT (Urea Breath Test), serological examinations, culturing the bacteria in the stomach, advanced molecular tests such as PCR, and histological examination through biopsy specimens taken during endoscopy (Xu et al., 2017).

H. Pylori is triggering and modulating different systems in the body such as regulation of different hormones including ghrelin and leptin that subsequently are involved in maintaining internal energy stability (Roper et al., 2008). Discrepancy in these hormone levels may affecting the food intake and absorption. For example, gastric leptin influence directly the leptin level in the serum that keeps the body weight in balance, inhibit the amount of food ingestion and enhance the energy metabolism but it also regulates the speed of stomach clearing and nutrient absorption in the intestinal tract. Furthermore, Ghrelin that promote the food consumption and reduces the outgoing energy and enhances the increase of body weight (Roper et al., 2008). Some researches have reported an increase serum level of ghrelin after riddance of *H. pylori* infection. Therefore, an increased interest is raised from investigators to find out the relationship between *H. Pylori* and overweight/obesity (den Hollander et al., 2017). The objective of this study is to determine whether there is a link between *H. pylori infection and overweight and obesity* in Kurdish population.

Methods

In a case-control study a total of 200 participants were participating including 100 patients that were clinically diagnosed with *H. pylori* and the other 100 participants were healthy and not affected with *H. pylori*. The serological data of *H. Pylori* patients were collected and compared with the serological test results of the healthy participants. Both groups (*H. pylori*-positive patients and healthy participants) filled in a questionnaire form and the weight and length were measured. The study design was adopted in Rezgary hospital in Erbil city, Alaa Laboratory in Soran Region, and volunteers who participated in a festival at Nobel institute Erbil wherein they tested for *H. pylori* in Erbil city. Some participants' data who were healthy and negative for *H.pylori* was collecting via telephone in another city such as Sulemani and Ranya. The Body mass index (BMI) was assessed from the length in meters and the weight of the participants in kilograms. It is a easy to use indicator of weight-for-height that is generally utilized to categorize overweight and obesity in adults.

The data were collected from patients who were diagnosed with *H. pylori* infection and healthy persons lack of *H. pylori* infection. The questionnaire was carefully designed under the supervision of our supervisor in this project, and it includes the basic information of the participants such as name, age, gender, length, weight, family history with *H. Pylori*, sleeping condition, food habits. The results were obtained using a statistical program (SPSS version 26 and GraphPad Prism (V.6)). Statistical analysis was performed for all variables and the p-value was obtained at 95% confidence.

Results

The study included 100 patients with *H.pylori* infection, comprising 28% males and 72 % females. The demographic characteristics (age and gender) for both groups are shown in table 1. The patients were further distributed in three different age groups. The age group (16-40) is comprised of (18 %), (52%) for males and females, respectively. While patients in the age group (41-63) comprised 9% for males and 19% for females. On the other hand, only 1% of males and females of the oldest group patients (64-87) are infected with *H. pylori*.

Table 1: Demographic characteristics (age & gender) for *H. pylori*-positive group and healthy group

Age (year)	H.pylori positive Male	Female	Total	Control (healthy persons) Male	Female	Total
16-40	18	52	70	19	69	88
41-63	9	19	28	5	4	9
64-87	1	1	2	3	0	3
Total	28	72	100	27	73	100

The table below shows that there was a significant difference (P=0.0023) between the age of *H.pylory* positive patients and the healthy control group. However, the mean BMI in obese subjects were not significantly different compared to the control group (p=0.6728). Furthermore, there is no significant difference between male (P= 0.0598) subjects and females (P=0.9395) in obese patients infected with *H. Pylori* compared to the control group.

Table 2: statistical data and the significance of some parameters

	H.pylori positive	Control (healthy persons)	P value
Overall Age mean ± SEM	32.77 ± 1.443	27.1 ± 1.130	0.0023
BMI in obese subjects mean ± SEM	33.09 ±1.050	33.75 ± 0.8878	0.6728
Gender of obese subjects	Female (13)=(81.25%) Male (3)=(18.75%)	Female (6)=(66.7 %) Male (3)=(33.3 %)	P=0.9395 P= 0.0598).

Table 3 shows the relationship between *Helicobacter pylori*-positive patients and healthy persons in three different age groups and its significant correlation.

Table 3: Prevalence of H. pylori in association with BMI

BMI/Age (years)	H. pylori-positive patients			Control (healthy persons)			P. value
	16-40	41-63	64-87	16-40	41-63	64-87	
below 18.5	12	0	0	6	0	0	
18.5-24.9	35	8	1	56	1	0	
25-29.9	17	10	1	23	4	1	0.0265
more than 30 (obesity)	6	10	0	3	4	2	
Total patient (%)	70	28	2	88	9	3	

The prevalence of *H. pylori* infections in the age group (16-40) years was 70%, while in the middle-aged group (41-63) is 28% and in age oldest group (64-87) was only 2%. This might indicate that people under age 40 have the highest chance to get infected with *H. pylori*.

The prevalence of obese persons with *H. pylori* infection in the age group (16-40) was 6%, while in age group (41-63) was 10% and in age group (64-87) is 0%. All together it makes a prevalence of 16% of *H.pylori* infection in obese patients in all age groups. This might indicate that an obese person between 41 and 61years has more chance to be infected with *H. pylori*. This result also showed the prevalence of obesity is significantly higher in *H. pylori*-positive patients compared to the control group in both younger groups

Table 4 demonstrates the association between *Helicobacter pylori* infection and common types of food the person is consuming either home-made food or fast food. In this study, the results showed that is the prevalence of persons with *H. pylori* infection that are eating fast food in all age groups is significantly higher compared to healthy persons.

Twenty-eight percent of *H. pylori*-infected patients were eating fast foods, while the prevalence of healthy persons that eating fast foods was only 3%.

The prevalence consumption of homemade food was lower in *H. pylori*-infected persons (69%) compare to healthy persons which were 89%. This might explain a higher BMI and Obesity in *H. pylori*-positive group compared to the control group.

Table 4: Distribution of BMI in H. pylori-positive patients and control group according to the type of food consumption

BMI	H. pylori-positive			Control (healthy persons)			P. value
	Fast Food	Home Food	(Fast Food and Home Food)	Fast Food	Home Food	Both (Fast Food and Home Food)	
below 18.5	6	6	0	0	6	0	0.0166
18.5-24.9	11	31	2	3	49	5	
25-29.9	6	21	1	0	27	1	
more than 30	5	11	0	0	8	1	
Total patient (%)	28	69	3	3	89	8	

Figure 4 showed that a higher BMI (>30) is more common in *H. pylori*-infected persons (16%) compared to healthy persons (9%). The prevalence of *H. pylori* patients with BMI between (18.5-24.9) was lower in the infected patient (44%) while in healthy persons was57%. The prevalence of *H. pylori* patients with BMI between 25 and 29.9 is the same as the control group which is 28%.

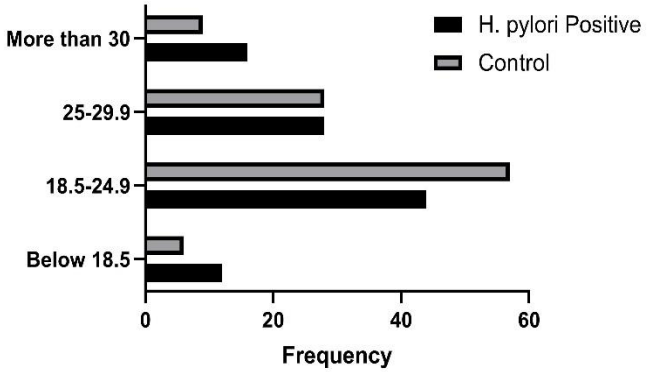

Figure 4: Comparison between patients with H. pylori infection and healthy persons according to body mass index

Discussion

Our current study highlights the importance of high BMI and weight gain associated with *H. pylori*. Our data showed a prevalence of 16% in the *H. pylori*-positive obese patients compared to the healthy group which was only 9%. This data is opposed to the Chinese retrospective study done in 2017. There they found a prevalence of 54.6% in the obese subjects. The reason for this big difference could be due to a bigger sample size where they found 212 *H. pylori*-positive patients out of 388 obese subjects. Though, the prevalence of obesity in *H. Pylori* positive group was significantly higher than those in healthy participants group (p<0.0265). Our study findings were consensus with previous studies reported in China[1].

Another meta-analysis study included 13,044 subjects from two large population-based cohorts. Their analysis did not demonstrate an association between *H. pylori* colonization and BMI even they tried different tests (serology, nor by faecal antigen) for detecting *H. Pylori*. This contrasts with our findings.

Our study also demonstrates that there are significant differences (p=0.0023) in the mean age of obese and none-obese participants. This finding was contradictive to the data of Al-Zubaidi in 2018, where they didn't find significant differences (p = 0.307). Al-Zubaidi also reveals that the males were predominant in both groups (66.5% and 64.4%), while our data show *H. pylori* obese group has more females (81.25%) and only (18.75%) males. likewise in the control group, the females were prominence (66.7%) and males account only for (33.3%). However, the gender differences in obese patients with *H. pylori*-positive group were not significant, neither for females (P=0.9395) nor for the male (P= 0.0598) compared to the control group.

We also demonstrated that the mean BMI in the obese group was not significantly (p= 0.6728) lower than that in the healthy group, while Mei-Yan Xu and his colleagues found a slightly higher mean of BMI. However, their finding was not significant (p=0.729) even after adjustment for potential confounding factors.

Finally, we assessed whether the type of food consumption is associated with higher BMI and the prevalence of *H. pylori*. Our result confirmed that the *H. pylori*-positive group is consuming significantly more fast food then the healthy control group and therefore the higher BMI is probably the consequence of this food habit that together leads to an increased chance for developing *H. pylori* infection. There was more research needed and more factors like genetics should be included to be able to draw a definitive conclusion about the relationship between obesity and *H. pylori* infection.

References

2001. *In:* MOBLEY, H. L. T., MENDZ, G. L. & HAZELL, S. L. (eds.) *Helicobacter pylori: Physiology and Genetics.* Washington (DC): ASM Press

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ABBAS, M., SHARIF, F. A., OSMAN, S. M., OSMAN, A. M., EL SANOUSI, S. M., MAGZOUB, M. & IBRAHIM, M. E. 2018. Prevalence and Associated Symptoms of Helicobacter pylori Infection among Schoolchildren in Kassala State, East of Sudan. *Interdiscip Perspect Infect Dis,* 2018**,** 4325752.

AL-ZUBAIDI, A. M., ALZOBYDI, A. H., ALSAREII, S. A., AL-SHAHRANI, A., ALZAMAN, N. & KASSIM, S. 2018. Body Mass Index and Helicobacter pylori among Obese and Non-Obese Patients in Najran, Saudi Arabia: A Case-Control Study. *Int J Environ Res Public Health,* 15.

BARADARAN, A., DEHGHANBANADAKI, H.,

NADERPOUR, S., PIRKASHANI, L. M., RAJABI, A., RASHTI, R., RIAHIFAR, S. & MORADI, Y. 2021. The association between Helicobacter pylori and obesity: a systematic review and meta-analysis of case–control studies. *Clinical Diabetes and Endocrinology*, 7**,** 15.

BHUROSY, T. & JEEWON, R. 2014. Overweight and obesity epidemic in developing countries: a problem with diet, physical activity, or socioeconomic status? *TheScientificWorldJournal*, 2014**,** 964236-964236.

BRAVO, D., HOARE, A., SOTO, C., VALENZUELA, M. A. & QUEST, A. F. 2018. Helicobacter pylori in human health and disease: Mechanisms for local gastric and systemic effects. *World journal of gastroenterology*, 24**,** 3071-3089.

CHEN, L. W., KUO, S. F., CHEN, C. H., CHIEN, C. H., LIN, C. L. & CHIEN, R. N. 2018. A community-based study on the association between Helicobacter pylori Infection and obesity. *Sci Rep*, 8**,** 10746.

CHOOI, Y. C., DING, C. & MAGKOS, F. 2019. The epidemiology of obesity. *Metabolism*, 92**,** 6-10.

DEN HOLLANDER, W. J., BROER, L., SCHURMANN, C., MEYRE, D., DEN HOED, C. M., MAYERLE, J., HOFMAN, A., HOMUTH, G., UITTERLINDEN, A. G., LERCH, M. M. & KUIPERS, E. J. 2017. Helicobacter pylori colonization and obesity - a Mendelian randomization study. *Sci Rep*, 7**,** 14467.

DIACONU, S., PREDESCU, A., MOLDOVEANU, A., POP, C. S. & FIERBINȚEANU-BRATICEVICI, C. 2017. Helicobacter pylori infection: old and new. *J Med Life*, 10**,** 112-117.

FRUH, S. M. 2017. Obesity: Risk factors, complications, and strategies for sustainable long-term weight management. *J Am Assoc Nurse Pract*, 29**,** S3-s14.

HRUBY, A. & HU, F. B. 2015a. The Epidemiology of Obesity: A Big Picture. *Pharmacoeconomics*, 33**,** 673-89.

HRUBY, A. & HU, F. B. 2015b. The Epidemiology of Obesity: A Big Picture. *PharmacoEconomics*, 33**,** 673-689.

JEFFERY, P. L., MCGUCKIN, M. A. & LINDEN, S. K. 2011. Endocrine impact of Helicobacter pylori: focus on ghrelin and ghrelin o-acyltransferase. *World journal of gastroenterology*, 17**,** 1249-1260.

KOUITCHEU MABEKU, L. B., NOUNDJEU NGAMGA, M. L. & LEUNDJI, H. 2018. Potential risk factors and prevalence of Helicobacter pylori infection among adult patients with dyspepsia symptoms in Cameroon. *BMC Infectious Diseases*, 18**,** 278.

KYROU, I., RANDEVA, H. S., TSIGOS, C., KALTSAS, G. & WEICKERT, M. O. 2018. Clinical problems caused by obesity. *Endotext [Internet]*.

LEE, A., CARDEL, M. & DONAHOO, W. T. 2019. Social and environmental factors influencing obesity. *Endotext [Internet]*.

NUERTEY, B. D., ALHASSAN, A. I., NUERTEY, A. D., MENSAH, I. A., ADONGO, V., KABUTEY, C., ADDAI, J. & BIRITWUM, R. B. 2017. Prevalence of obesity and overweight and its associated factors among registered pensioners in Ghana; a cross sectional studies. *BMC obesity*, 4**,** 26-26.

PANUGANTI, K. K., NGUYEN, M., KSHIRSAGAR, R. K. & DOERR, C. 2021. Obesity (Nursing).

PARIKH, N. S. & AHLAWAT, R. 2021. Helicobacter Pylori. *StatPearls*. Treasure Island (FL): StatPearls Publishing

PI-SUNYER, X. 2009. The medical risks of obesity. *Postgrad Med*, 121**,** 21-33.

ROPER, J., FRANCOIS, F., SHUE, P. L., MOURAD, M. S., PEI, Z., OLIVARES DE PEREZ, A. Z., PEREZ-PEREZ, G. I., TSENG, C.-H. & BLASER, M. J. 2008. Leptin and Ghrelin in Relation to Helicobacter pylori Status in Adult Males. *The Journal of Clinical Endocrinology & Metabolism*, 93**,** 2350-2357.

WANG, M., KONG, W.-J., ZHANG, J.-Z., LU, J.-J., HUI, W.-J., LIU, W.-D., KANG, X.-J. & GAO, F. 2020. Association of Helicobacter pylori infection with colorectal polyps and malignancy in China. *World journal of gastrointestinal oncology*, 12**,** 582-591.

XU, M. Y., LIU, L., YUAN, B. S., YIN, J. & LU, Q. B. 2017. Association of obesity with Helicobacter pylori infection: A retrospective study. *World J Gastroenterol*, 23**,** 2750-2756.

XU, X., LI, W., QIN, L., YANG, W., YU, G. & WEI, Q. 2019a. Relationship between Helicobacter pylori infection and obesity in Chinese adults: A systematic review with meta-analysis. *PLoS One*, 14**,** e0221076.

ZAMANI, M., EBRAHIMTABAR, F., ZAMANI, V., MILLER, W. H., ALIZADEH-NAVAEI, R., SHOKRI-SHIRVANI, J. & DERAKHSHAN, M. H. 2018. Systematic review with meta-analysis: the worldwide prevalence of Helicobacter pylori infection. *Aliment Pharmacol Ther*, 47**,** 868-876.