Available online at www.rajournals.in

RA JOURNAL OF APPLIED RESEARCH
ISSN: 2394-6709
DOI:10.47191/rajar/v10i1.02
Volume: 10 Issue: 01 January -2024

International Open Access

Impact Factor- 8.174

Page no.- 06-11

Identifying and Isolating of H. pylori in patients who are experiencing Inflammation in their Gastrointestinal tract

Dhuha Abdullah Kadhim[1], Hind AL-Hammami[2]
[1,2] Jabir Ibn Hayyan University for Medical and Pharmaceutical Sciences, Faculty of Medicine

ARTICLE INFO

Published Online:
09 January 2024

ABSTRACT

Background: Peptic ulcer illness, stomach cancer and chronic gastritis are gastro-duodenal diseases that are mostly caused by Helicobacter pylori, or H. pylori.

Objective: To find out how common Helicobacter pylori infection is among patients at Al Sadder Teaching Hospital in Al-Najaf, Iraq, as well as related factors including age, gender, residency, and blood group.

Methods: The entirety of 197 patients—79 men and 118 women—of both genders and various age groups—from under 10 to around 60 years old—were reported to have symptoms of gastrointestinal inflammation.

Result: The total numbers of participants in the current study were 197 patients, found 156 (79.2%) positive and 41(20.8%) negative results**.** Females had a greatest percentage of H. pylori (47.2%), while males had the lowest incidence of prevalence (32%). The age group (31-40) had greatest percentage with (14.7%), followed by the age group (41-50) with (13.2%), and then the age group (21-30) with (11.7%) while lowest percentages in age groups < 10 and > 60 years old**.** The blood group type O, which had the greatest positive rate (27.9%), was followed by the blood groups types A, B, and AB, with 16.8%, 13.7%, and 4.1%, respectively. People who live in rural areas (30.4%) have a elevated frequency of H. pylori infection when compared with persons who reside in urban areas (28.4%).

Conclusion: The findings showed that H. pylori was more frequent in women than men, in rural areas, and in patients between the ages of 31 and 40. Additionally, individuals with the O blood group had higher H. pylori frequency.

Corresponding Author:
Dhuha Abdullah Kadhim

KEYWORDS: *H. pylori*, O blood group**,** Female, infections.

INTRODUCTION

Originally known as Campylobacter pylori, "Helicobacter pylori" is spiral-shaped, genus *Helicobacteraceae*, gram-ve, microaerophilic, motile bacillus that moves into the stomach and passes through the mucous gastric layer(bind to blood group antigens that are expressed on the stomach mucosa's surface) or superior part of small intestine and is most frequently observed in the duodenum's gastric metaplasia sites and the stomach antrum (can thrive in the stomach's extremely acidic environment). Because it does not pass through the epithelial barrier. Helicobacter pylori is considered non-invasive and is linked to chronic gastritis, peptic ulcers, duodenal ulcers, and gastritis. Additionally, it has been linked to the developing stomach adenocarcinoma and mucosa associated lymphoid tissue lymphoma (MALT) (Hussain et al., 2008 ; Ansari and Yamaoka , 2017).

Multifactorial etiology is thought to explain the pathophysiology of Helicobacter pylori. This microorganism's pathogenicity is thought to include: circumstances in the environment, host genetic variants, immune system reactions, and infectious virulence variables. H. pylori has been linked in many investigations to a variety of illnesses other than stomach problems, such conditions as ischaemic cardiac disease, sclerotic, thyroiditis due to autoimmune disease, migraines, thrombocytopenic purpura, Guillain-Barr syndrome, Raynaud's disorder, and dermatological conditions such thrombocytopenic purpura and also idiopathic urticaria (Gravina et al., 2018). The production of ammonia and biochemical molecules by these bacteria, which including urease enzyme, protein proteases, phospholipases, and vacuolating cytotoxin (A), significantly elevate the bacterium's sensitivity to inflammation and tumors (Dhakal and Dhakal, 2018). Helicobacter pylori's

precise route of transmission is unidentified but feces-polluted drinking water has been proposed as a possible source of disease transmission. Gastrointestinal or faecal-oral transmission is another way that H. pylori can proliferate (Klein et al., 1991; Mladenova et al., 2006).

H. pylori does not cause any particular clinical symptoms or manifestations, and the majority of people suffering from it have no symptoms at all. On the other hand, nausea, vomiting, heartburn, esophagitis, diarrhea, delayed stomach emptying, evening starvation, and foul breath are typical indications and symptoms (Ayodele et al., 2018).

The majority of developing nations, including Iraq, have very dispersed epidemiological data regarding the incidence of infection with H. pylori, the incidence of infection with *H. pylori* was roughly 55.8% in Erbil (Hussen et al., 2013), in Basrahcity with 54.5% (Amer et al., 2014), in Baghdad city with 59.2% (Al-Mossawei et al., 2016), in Hilla city with 51.% (Al-Sabary et al., 2017), in Tikrit city with 55.8% (Alsamarai et al., 2017), in Sulaimani city about 51.2% (Mohammed et al., 2017), in Kirkuk city approximately 49.62% (Abdul Razaq et al., 2017), in Misan city about 51.11% (Alhashimi et al., 2017), in Mosul city with 61.32% (Ali, 2018), and finally in Duhok city with 28% (Yahya, 2018) was found.

In developing nations, H. pylori is present in approximately 70%–90% of the general population, with most infections occurring during childhood; in industrialized nations, the incidence ranges from 30% to 40%. This higher percent due to many reasons that assist with this infection such social circumstances, age, economic status, low levels of education, poor nutrition, living in an urban area, overcrowding, insufficient hygiene, running water, ethnicity,, geographical distribution, gender, a poor water supply, and fast food intake (Bello et al., 2018).

Both invasive and noninvasive techniques exist to diagnosing H. pylori infectivity. The invasive technique uses polymerase chain reaction, histological testing, culture, endoscopy, rapid urease test and biopsy. The stool antigen test, serological testing, urinary antibody test and the urea breath test are examples of non-invasive techniques (Majeed and Abdullah, 2019). Immunochromatographic testing is one of the serological methods that is frequently employed to diagnose H. pylori due to low cost and easy availability at any laboratories (Rishma et al., 2018).

MATERIAL AND METHODS

1-Sampling

Cross-sectional study was done at the Al Sadder Teaching Hospital in Al-Najaf, Iraq, during the period September to October 2023. Prior to their enrollment in the clinical study, each individual participant provided written consent. 197 patients (79 men and 118 women) of both sexes and varying age groups—from under 10 to around 60 years old—were reported to have symptoms of gastrointestinal inflammation (digestive dysmotility, nausea and vomiting disorders, duodenal inflammation, stomach inflammation, reflux, epigastric discomfort and burning). The patient personal information, such as age, gender, and residence location (urban & rural).These specimens were performed for bacteriological analysis at Microbiology department/ faculty of Medicine/ Jabir Ibn Hayyan University for medical and pharmaceutical sciences.

2- H. pylori Ab detection in plasma or serum samples of blood.

The process of directly diagnosing Helicobacter pylori infection by serum antibody detection was carried out by Wondfo, One Step H.Pylori Serum/Plasma Test (Guangzhou Wondfo Biotech Co., Ltd. China) is a quick chromatographic immunoassay that helps diagnose H. pylori infection by qualitatively detecting antibodies to H. pylori bacteria in serum or plasma. The test protocol was followed in accordance with the test booklet provided by:

1- One drop of whole blood serum or plasma should be dispensed into the cassette's well. As shown in Fig. 1.

2- After adding the specimen, add two drops of sample diluents (buffer) to sample pad's lower edge.

3- Examine results later than 15 minutes

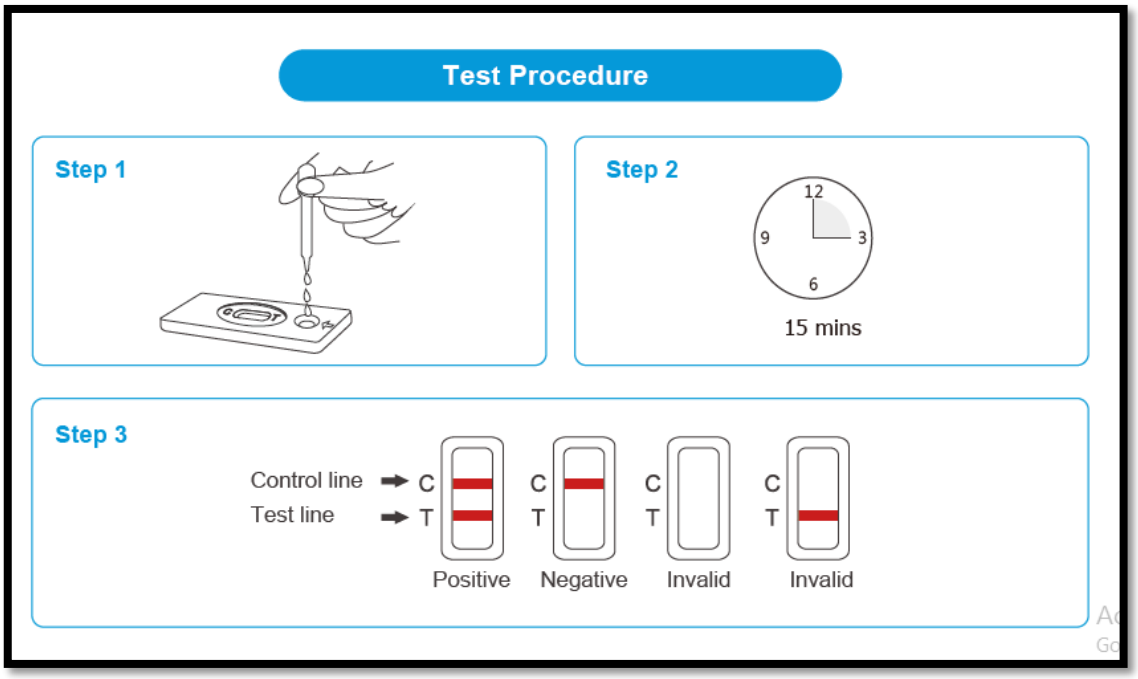

Fig 1: Wondfo, One Step H.Pylori Serum/Plasma Test

3- Monoclonal Blood Grouping Reagents (Lorne Laboratories Limited, UK)

Red blood cells with the ABO antigen will directly clump together due to the presence of antibodies against the antigen on human red blood cells in these reagents. The absence of ABO antigen on human red blood cells is often shown by the absence of agglutination.

RESULTS

The total numbers of participants in the current study were 197 patients, found 156 (79.2%) positive and 41(20.8%) negative results. Fig 2

Fig 2: Positive H.Pylori Serum/Plasma Test

Table 1 displays the frequencies of H. pylori detection by gender. The high positive percentage was 93 (47.2%) in females and the low positive percentage was 63 (32%) in males.

Table 1: H. pylori prevalence according gender.

Genders	H. pylori Test		Total
	+ve (%)	-ve(%)	
Male	63 (32%)	16 (8.1%)	79 (40.1%)
Female	93 (47.2%)	25 (12.7%)	118 (59.9%)
Total	156 (79.2%)	41 (20.8%)	197 (100%)

The age group (31-40) had the greatest percentage of Helicobacter pylori infection, with 29 (14.7%), followed by the age group (41-50) with 26 (13.2%), and the age group (21-30) with 23 (11.7%). The age groups < 10 and > 60 years old had the lowest percentages of Helicobacter pylori infection, with 0.5% and 1.0%, respectively. According to Table 2.

Table 2: Age-related H. pylori infections

Age	No.	H. pylori Test	
		+ve (%)	-ve (%)
<10	1(0.5%)	1(0.5%)	0(0%)
11-20	12(6.1%)	8(4.1%)	4(2%)
21-30	67 (34%)	23(11.7%)	44(22.3%)
31-40	50 (25.4%)	**29**(14.7%)	21(10.7%)
41-50	44(22.4 %)	26(13.2%)	18(9.2%)
51-60	18(9.1 %)	12(6.1%)	6(3%)
>60	5(2.5 %)	2(1.0%)	3(1.5%)
Total	197 (100%)	101(51.3%)	96(48.7%)

The blood group type O, which had the greatest positive rate (27.9%), was followed by the blood groups types A, B, and AB, with 16.8%, 13.7%, and 4.1%, respectively. According to Table 3's illustration.

Table 3: Distribution of anti-H. pylori antibodies by blood group.

Blood group	H. pylori Test		Total
	+ve (%)	-ve(%)	
A	33 (16.8%)	20 (10.1%)	53 (26.9%)
B	27 (13.7%)	14 (7.1%)	41 (20.8%)
AB	8 (4.1%)	17 (8.6%)	25 (12.7%)
O	**55**(27.9%)	23(11.7%)	78 (39.6%)
Total	123 (62.5)	74 (37.6)	197 (100%)

The frequency of H. pylori infection was found to vary by residential region, with urban regions reporting an elevated prevalence of 56 (28.4%) and rural regions reporting a low prevalence of 60 (30.4%). Based on Table 4.

Table 4: Infection with Helicobacter pylori accordance to residency.

Residency	H. pylori Test		Total
	+ve (%)	-ve (%)	
Rural	60 (30.4%)	47 (23.9%)	107 (54.3%)
Urban	56 (28.4%)	34 (17.3%)	90 (45.7%)
Total	116 (58.8%)	81(41.2%)	197 (100%)

DISCUSSION

Helicobacter pylori is a serious global health concern that is essential to the pathophysiology of stomach cancer, which is the 5th most frequent type of cancer and the 3rd largest cause of mortality globally (Asghar and Parsonnet, 2001).

The current study finds that 79.2% of people had H. pylori infection. This is analogous to previous studies where reports of H. pylori infection have been made, such as those from Baghdad, Iraq (71.3%) and Mosul, Iraq (61.32%) (Gutef, 2016; Ali, 2018). However, these results was inconsistent with studies by ALmashhadany (2018), who discovered a lower incidence of H. pylori infection in Erbil, Iraq, at 11.3%, and Yahya (2018), who discovered a lower frequency of H. pylori infection in Duhok, Iraq, at 28%. The patient's age and health, inadequate hygiene habits, the number of specimens, inappropriate eating habits, the cultural traditions of the population, the geographic distribution, high levels of population density, ethnic background, testing procedures, and status in society could all of them explain the reason for this differences (Tsongo et al., 2015).

Females had a greatest percentage of H. pylori (47.2%), while males had the lowest incidence of prevalence (32%). The results we obtained were consistent with Yucelet al. (2008) in Turkey, who discovered that women were more susceptible to H. pylori infection, and Zhu et al. (2014), who discovered that women in China had a greater incidence of H. pylori infection than men. This finding, however, disagreements with that of Almashadany (2018), who discovered that men had an elevated prevalence of H pylori. The difference in hormones between the sexes and the fact that women are more likely than men to take care of food preparation and spending a longer period in the kitchen and housekeeping may be the cause of the greater infection rate among the women in our study (Mohammed et al., 2017).

In context of age-specific frequency of H. pylori, the age group (31-40) had greatest percentage with (14.7%), followed by the age group (41-50) with (13.2%), and then the age group (21-30) with (11.7%) while lowest percentages in age groups < 10 and > 60 years old. This is consistent with findings published by Udoh and Obaseki (2012), who discovered that individuals with H. pylori have a greater rate of infectivity in the adult or younger age group. As though This contradicts a study published in 2016 by Gutef, which showed a significant incidence of H. pylori infection in people over 50. The elevated prevalence of H. pylori infection in adults as a result of risk factor exposure, the dietary habits of the patient, social and economic status, insufficient hygiene, water supply, unsanitary surroundings, and contaminated food and water (Al-Mossawei et al., 2016).

Blood group O had the highest positive rate (27.9%) when compared to other blood types, while the AB blood group was less likely to become infected. According to a different study conducted in Egypt, blood group O was positively correlated with H. pylori infection, suggesting that this consider a risk factor for H. pylori infection (Shaldoum, 2015). The same outcome reported by Jaff (2011), who determined that those with the O blood type have a higher cellular and immune response to H. pylori infection and are more vulnerable to infection.

According to our research, people who live in rural areas (30.4%) found a elevated frequency of H. pylori infection when compared with persons who reside in urban areas (28.4%). This is consistent with research conducted in Misan-Iraq (Alhashimi et al., 2017) but disagreement with the research carried out in Tanzania. These differences between patients in rural and urban regions could be caused by poor sewage disposal, poor water supplies, poor sanitation, population social habits, low levels of education, and ignorance of health issues (Jaka et al., 2016).

CONCLUSION

The findings showed that H. pylori was more frequent in women than men, in rural areas, and in patients between the ages of 31 and 40. Additionally, individuals with the O blood group had higher H. pylori frequency.

REFERENCES

1. Hussain N.R., Robinson K. and Atherton J.C., A study of age specific *Helicobacter pylori* seropositivity rates in Iraq, Helicobacter. 13, 306-307 (2008).
2. Klein P D, Gilman R et al. (1991). Water source as risk factor for Helicobacter pylori infection in Peruvian children, Lancet, vol 337(8756), 1503–1506.
3. Fiedorek SC, Malaty HM, Evans DL, Pumphrey CL, Casteel HB, Evans DJ, Jr., et al. Factors influencing the epidemiology of Helicobacter pylori infection in children. Pediatrics. 1991;88:578–82.
4. Ansari S., Yamaoka Y., Survival of Helicobacter pylori in gastric acidic territory, *Helicobacter*, 2017, 22:e12386.
5. Gravina AG, Zagari RM, De Musis C, Romano L, Loguercio C, Romano M. Helicobacter pylori and extragastric diseases: A review. *World J Gastroenterol*. 2018;24(29):3204–21.
6. Mladenova I, Durazzo M, Pellicano R. Transmission of *Helicobacter pylori*: are there evidences for a fecal-oral route? Minerva Med. 2006 Feb;97(1):15-8.
7. Dhakal, O. P. and Dhakal, M. 2018. Prevalence of Helicobacter pylori infection & pattern of gastrointestinal involvement in patients undergoing upper gastrointestinal endoscopy in Sikkim. Indian J. Med. Res. 147(5): 517-520.
8. Ayodele, M. B. O., Aaron, U. U, Oluwatayo, G. A. and Wariso, K. T. 2018. Prevalence of Helicobacter pylori infection among suspected peptic ulcer patients in Port Harcourt, South- South, Nigeria. Gazette of Medicine. 6(1): 602-608.
9. Bello, A. K., Umar, A. B. and Borodo, M. M. 2018. Prevalence and Risk Factors for Helicobacter Pylori Infection in Gastroduodenal Diseases in Kano, Nigeria. Afr. J. Med. Health. Sci. 17(1):41-46.
10. Rishma, Nawaz, M., Shams, S. Khan, A., Hassan, H., Shah, M. and Gul Afridi, S. 2018. Frequency Distribution and Risk Factors of Helicobacter Pylori Infection in Patients with Gastric Problems in Mardan Pakistan. Biomed. J. Sci. Tech. Res. 3(1): 1-5.
11. Abdul Razaq, A. A., Ali Pambuk, C. I. and Salman, Y. J. 2017. Role of Helicobacter pylori in Gastro-Intestinal Tract Disorders (GITDs) among Patients in Kirkuk City, Iraq. Biosci. Biotech. Res. Asia. 14(3): 1159-1164.
12. Alhashimi, R. A. H., Alsaad, R. K. A., Alhilfi, H. S. Q. and Althaalibi, S. M. J. 2017. Helicobacter Pylori Infection, Epidemiology, Endoscopic Findings and Associated Socio-Demographic Factors in Uninvestigated Dyspepsia in the People of Misan, Iraq. J. Gastrointest. Disord. Liver Func. 3(2):109-113.
13. Ali, A. J. 2018. Prevalence of Helicobacter pylori Infection in Patients Complaining of Epigastric Pain and Dyspepsia, Mosul, Iraq. Sci. J. Med. Res. 2(8):187-188.
14. Yahya, N. B. 2018. Helicobacter pylori seropositivity among children in Duhok city, Iraq. Sci. J. Uni. Zakho. 6(3): 82-84.
15. Hussen, B. M., Qader, S. S., Ahmed, H. F and Ahmed, S. H. 2013. The Prevalence of Helicobacter

pylori among University Students in Iraq. Indian J. Sci. Tech. 6(8):5019-5023.
16. Amer, A. N., Hassan, J. G. and Al- Saimary, I. E. 2014. Is Helicobacter pylori infections in immunocompromised children a risk factor for cancer? Med. J. Islamic World Acad. Sci. 22(1): 36-41.
17. Mohammed, M. O., Bayz, H. H. and Maarouf, F. B. 2017. Clinical, Endoscopic and Urea Breath Test among Dyspeptic Patients Referred to Kurdistan Center for Gastroenterology and Hepatology in Sulaimani. Kurd. J. Appl. Res. 2(2): 89-95.
18. Al-Mossawei, M. T., Rzooqi, W. H. and Abdulrazzaq, S. 2016. Detection of Helicobacter pylori IgG and IgM Antibodies in Iraqi Dyspeptic Patients. Journal of Biotechnology Research Center. 10(1): 5-9.
19. Al-Sabary, A. H., Abdul Razzaq, M. S. and Wtwt, M. A. 2017. Genotyping of Helicobacter Pylori Isolated From Iraqi Patient with Upper Gastrointestinal Disease. J. G. P. T. 09(9):121-127.
20. Alsamarai, A. M., Thegeal, F. and Alobaidi, A. H. A. 2017. Frequency of Biomarkers Positivity in Iraqi Subject with Gastritis. Sci. Int. 5(2):68-83.
21. Majeed PD, Abdullah HM. Detection of *Helicobacter pylori* Antigens among Patients with Gastroenteritis in Erbil City, Iraq. Polytechnic Journal 2019;9:138-43.
22. Saini S., Katiyar R. and Deorukhkar S., Gram Stain versus Culture for Diagnosis of Pyogenic Infections, Pravara. Med. Rev. 6 (1), 9–11 (2011).
23. C. Monica, *Microbiological Tests: District Laboratory Practice in Tropical Countries*, 2nd ed. New York, USA: Cambridge University Press, 2006, ch. 2, pp. 62.
24. Gutef, E. H. 2016. Prevalence of Helicobacter pylori infection with peptic ulcer diseases in Iraqi patients. E. J. P. M. R. 3(4): 479-482.
25. Ali, A. J. 2018. Prevalence of Helicobacter pylori Infection in Patients Complaining of Epigastric Pain and Dyspepsia, Mosul, Iraq. Sci. J. Med. Res. 2(8):187-188.
26. ALmashhadany, D. A. 2018. Application of stool antigen test for monitoring Helicobacter pylori among human in Erbil governorate, Kurdistan region/Iraq. Int. J. Pharm. Sci. 10(11): 49-53.
27. Yahya, N. B. 2018. Helicobacter pylori seropositivity among children in Duhok city, Iraq. Sci. J. Uni. Zakho. 6(3): 82-84.
28. Tsongo, L., Nakavuma, J., Mugasa, C. and Kamalha, E. 2015. Helicobacter pylori among patients with symptoms of gastroduodenal ulcer disease in rural Uganda. Infec. Eco. Epid. 5: 26785.
29. Asghar RJ and Parsonnet J. *Helicobacter pylori* and risk for gastric adenocarcinoma. Seminars in gastrointestinal disease.2001; 12: 203-8.
30. Yucel T, Aygin D, Sen S and Yucel O. The Prevalence of*Helicobacter pylori* and Related factors among University students in Turkey, Japanese J. of Infectious Diseases2008; 61 (3):179-183.
31. Zhu Y, Zhou X, Wu J, Su J, Zhang G. Risk factors and prevalence of Helicobacter pylori infection in persistent high incidence area of gastric carcinoma in Yangzhong City. *Gastroenterol Res Pract*. 2014;2014:481365.
32. Mohammed, M. O., Bayz, H. H. and Maarouf, F. B. 2017. Clinical, Endoscopic and Urea Breath Test among Dyspeptic Patients Referred to Kurdistan Center for Gastroenterology and Hepatology in Sulaimani. Kurd. J. Appl. Res. 2(2): 89-95.
33. Gutef, E. H. 2016. Prevalence of Helicobacter pylori infection with peptic ulcer diseases in Iraqi patients. E. J. P. M. R. 3(4): 479-482.
34. Al-Mossawei, M. T., Rzooqi, W. H. and Abdulrazzaq, S. 2016. Detection of Helicobacter pylori IgG and IgM Antibodies in Iraqi Dyspeptic Patients. Journal of Biotechnology Research Center. 10(1): 5-9.
35. Udoh MO, Obaseki DE. (2012) Histopathological evaluation of H. pylori associated gastric lesions in Benin city, Nigeria. East African medical journal.; 89 (12):408-13
36. Shaldoum FM. *Helicobacter pylori* and Egyptian blood group types. Curr Sci Int 2015;4:714-23.
37. Jaff, M. S. 2011. Relation between ABO blood groups and Helicobacter pylori infection in symptomatic patients. Clin. Exp. Gastoenterol. 4:221-226.
38. Jaka, H., Mushi, M. F., Mirambo, M. M., Wilson, L., Seni, J., Mtebe, M. and Mshana, S.E. 2016. Sero-prevalence and associated factors of Helicobacter pylori infection among adult patients with dyspepsia attending the gastroenterology unit in a tertiary hospital in Mwanza, Tanzania. Afri. Health Sci. 16(3): 684-689.