Scientific Knowledge Group

*Research Article*

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# The Prevalence of Helicobacter Pylori and Histological Lesions Found in a Subset of Syptomatic Patients who Underwent Upper Endoscopy in Namibia

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## ABSTRACT

***Background**: Helicobacter pylori is prevalent worldwide, with a documented incidence of more than half the total population. The majority of cases occur in developing countries, accounting for 70% of the total. Currently, the status of H. Pylori in Namibia is unknown. Persistent infection with H. pylori has been shown to increase the risk of gastric cancer. Diagnosis and eradication of H. pylori are key to mitigating the consequences.*

***Objectives**: To determine the prevalence of H. pylori infection and to describe the histopathological findings with emphasis on pre-cancerous transformation.*

***Methods**: A retrospective review of the histological specimens obtained from a subset of patients that underwent upper endoscopy between 2016 to 2024 in five regions of Namibia was carried out. A total number of 1352 patients were included in this study. SPSS version 26 was used to analyze the data.*

***Results**: The overall H. pylori infection prevalence was 1141/1352 (84.3%). The prevalence was higher in females 784 (68.7%) than in males 357 (31.3%), although not statistically significant (OR=, P=0.63 95%CI). The common histological finding was mild chronic gastritis in 700/1352 (51.7%). Intestinal metaplasia was present in 168 (12.4%), which was noted in mild, moderate and severe gastritis.*

***Conclusion**: The study demonstrates a high prevalence of H. Pylori infection in this population. The presence of intestinal metaplasia in 12.4% warrant intense surveillance and appropriate management to prevent progression to gastric malignancy. Further research is needed to assess the molecular strains and resistance profile in Namibia.*

**Keywords:** Helicobacter Pylori, Prevalence, Histological Lesions, Upper Endoscopy, Namibia, Gastric Pathology, Infection Rates, Developing Countries, H. pylori Diagnosis, Gastrointestinal Diseases.

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## Introduction

Helicobacter pylori is a microaerophilic, urease-producing gram-negative bacillus that colonizes the gastric mucosa. In 1994, it was recognized as a Group I carcinogen by the International Agency for Research on Cancer and to date is associated with more than 90% of gastric cancers [1, 2]. Its popularity has increased with a worldwide prevalence of more than half the total population. In Africa, the incidence is estimated at 70% [3]. The increased numbers of H. pylori infection in developing countries are attributed to low socioeconomic status, poor sanitation and overcrowding [4]. Studies have demonstrated neglect of H. pylori research in developing countries due to the high prevalence of other deadly infectious diseases like Human Immunodeficiency Virus, Tuberculosis, and Malaria. This has led to a diversion of resources to combat these ailments [5].

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H. pylori infection is characterized by a spectrum of clinical presentations, ranging from asymptomatic cases to the development of chronic gastritis. In persistent disease, it may progress to atrophic gastritis, metaplasia, dysplasia, and finally adenocarcinoma [6]. The development of gastric malignancy in patients infected with H. pylori is influenced by a complex interplay of several factors including bacterial load, virulence factors, host genetic factors and environmental factors [7]. Numerous diagnostic modalities exist, however upper endoscopy and biopsy remains the gold standard for detection of H. pylori with sensitivity and specificity of 95% and 90% respectively [8, 9]. Eradication of H. pylori remains the definitive cure and has been demonstrated to reverse the progression of precancerous lesions [10].

This article aims to determine the prevalence of H. pylori in a subset of patients from the private sector as well as identification of precancerous lesions. The relationship between factors such as bacterial load and the activity status of H. pylori in the progression to precancerous lesions is assessed.

## Methods

### Study Design and Population

The study included 1353 consenting patients that underwent an upper endoscopy between the time period 2016 to 2024. All patients that underwent upper endoscopy had symptomatic disease. Patients were recruited from five regions in Namibia. All age groups were included.

### Data Collection

Patients underwent upper endoscopy and biopsy of gastric antral mucosa. Specimens were taken to the private single laboratory, namely Northern Pathology Sciences (NPS).

### Histological Analysis

Histopathological assessment was performed using the revised Sydney classification to grade chronic inflammation, intestinal metaplasia and dysplasia.

### Statistical Analysis

A retrospective review was carried out with the Statistical Package for Social Sciences (SPSS) utilized to analyse data. The prevalence of H. pylori was calculated as a percentage and associations between H. pylori and histological lesions were assessed using chi – square and logistic regression analyses. A p – value of <0.05 was considered statistically significant.

## Results

### Patient Characteristics

This manuscript presents a comprehensive analysis of patient data regarding H. pylori infection, age prevalence, bacterial load, and associated clinical factors. The dataset encompasses a total of 1,352 patients entered from 2016 to 2024, with the highest number of entries recorded in 2022 (323 patients), followed by 2021 (191 patients) and 2020 (189 patients). The analysis aims to elucidate the demographic and clinical characteristics of the patient population, as well as the implications of H. pylori infection in relation to age, sex, region and bacterial load.

**Table 1: Shows the Patient Entry per Year**

| Year | Number of Patients |
|---|---|
| 2016 | 6 |
| 2017 | 79 |
| 2018 | 60 |
| 2019 | 134 |
| 2020 | 189 |
| 2021 | 191 |
| 2022 | 323 |
| 2023 | 273 |
| 2024 | 97 |

**Age:** The mean age of the patients was found to be 45.4 years. The standard deviation (SD) was calculated to be 15.78 years, indicating a moderate amount of variation from the mean age. Approximately 68% of ages fell within one standard deviation (29.62 to 61.18 years), and 95% fell within two standard deviations (13.84 to 76.96 years). The interquartile range (IQR) was 21 years, with half of the ages falling between 35 and 56 years.

H. pylori infection rates were observed across various age groups, with positivity ranging from 80% to 87%. The highest rate (87.2%) was found in the 51-60 years age group, while the lowest (80.0%) occurred in the 0-10- and 11-20-years age groups.

A p-value of 0.51 indicates that age is not a significant determinant of H. pylori infection in this population.

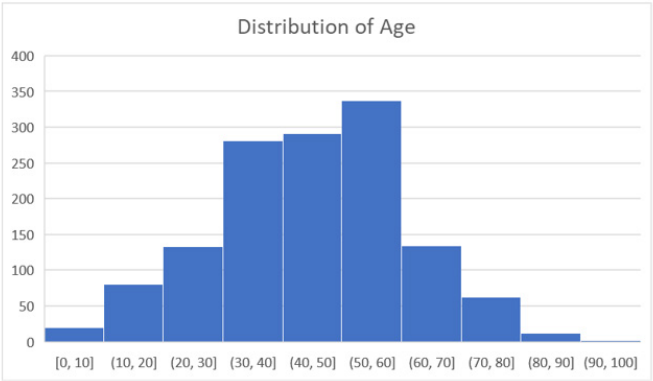


**Figure 1**: shows the distribution of the age group of the patients across the 5 regions

**Table 2**: **Shows the Relationship between the Age of the Patients and the H-Pylori Infection. With the P-value of 0.51, Shows that it is not Statistically Significant**

| | | BACTERIA STATUS | | | |
|---|---|---|---|---|---|
| **Variable** | **Category** | **Negative** | **Positive** | **Total** | **P-Value** |
| **Age Grouped** | **0-10 years old** | 4(1.9) | 16(1.4) | 20(1.5) | |
| | **11-20 years old** | 16(7.6) | 64(5.6) | 80(5.9) | |
| | **21-30 years old** | 21(10.0) | 112(9.8) | 133(9.8) | |
| | **31-40 years old** | 40(19.0) | 241(21.1) | 281(20.) | |

| | | | | | |
|---|---|---|---|---|---|
| | **41-50 years old** | 46(21.8) | 245(21.5) | 291(21.0) | |
| | **51-60 years old** | 43(20.4) | 294(25.8) | 337(24.0) | |
| | **61-70 years old** | 26(12.3) | 108(9.5) | 134(9.9) | |
| | **>70 years old** | 15(7.1) | 61(5.3) | 76(5.6) | |
| | **Total** | 211(100) | 1141(100) | 1352(100) | |

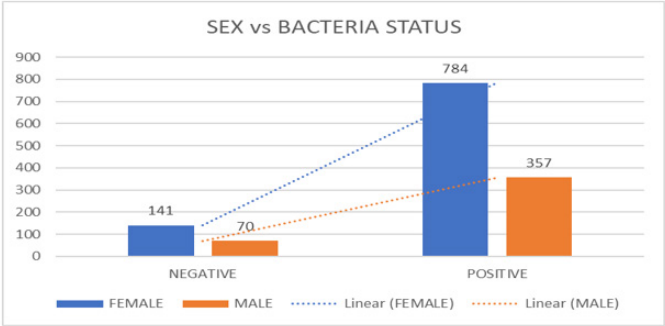


**Figure 2:** Shows the trending of the H-Pylori amongst the female and male patients

**Table 3**: **Illustrates the Relationship between the H-Pylori Infection Status and the Sex. The Pvalue Shows that it is not Statistically S ignificant**

| | | SEX | | | |
|---|---|---|---|---|---|
| **Variable** | **Category** | **Female** | **Male** | **Total** | **P-Value** |
| **BACTERIA STATUS** | **Negative** | 141(66.8) | 70(33.2) | 211(100) | 0,63 |
| | **Positive** | 784(68.7) | 357(31.3) | 1141(100) | |
| | **Total** | 925(68.4) | 427(31.6) | 1352(100) | |

**Sex Distribution and H. pylori Infection**: Overall, the majority of patients were H. pylori positive (84.5% of females and 83.6% of males), suggesting a high burden of infection across both sexes. A p-value of 0.63 indicates that the difference in infection rates between males and females is not statistically significant.

## H. pylori Prevalence by Region

**Table 4: Illustrates the Relationship between the H-Pylori Infection and Load. There is Statistically Significant Evident**

| | | Lab Diagnosis | | | | | |
|---|---|---|---|---|---|---|---|
| **Variable** | **Category** | **Normal** | **Chronic Gastritis** | **Mild Chronic** | **Severe Chronic** | **Total** | **P-Value** |
| Region | Oshikoto | 7(4.5) | 15(9.7) | 97(62.6) | 36(23.2) | 155(100) | <.001 |
| | Oshana | 14(2.6) | 138(25.4) | 253(46.6) | 138(25.4) | 543(100) | |
| | Hardap | 19(5.1) | 45(12.0) | 206(54.9) | 105(28.0) | 375(100) | |
| | Ohangwena | 2(2.3) | 18(20.7) | 44(50.6) | 23(26.4) | 87(100) | |
| | Otjozondjupa | 4(2.1) | 22(11.5) | 100(52.1) | 66(34.4) | 192(100) | |
| | Total | 46(3.4) | 238(17.6) | 700(51.8) | 368(27.2) | 1352(100) | |

Across all regions, mild chronic gastritis was the most common diagnosis, followed by severe chronic gastritis and normal findings. A significant proportion (95-97%) of patients exhibited some degree of chronic gastritis, with severe cases affecting 23-34% of patients, particularly in the Otjozondjupa and Hardap regions. A statistically significant difference in the distribution of diagnoses was found across regions (p-value < 0.001). The Oshana region exhibited the highest prevalence of H. pylori infections.

## Bacterial Load

The majority of observations (49%) indicated a moderate bacterial load, while over a quarter (27%) had a heavy bacterial load. A small percentage (4%) fell into the very heavy category, and nearly 20% of observations were classified as NA due to missing data. This indicates a right-skewed distribution (Figure 3), highlighting the need for improved data collection methods. A p-value of <0.001 indicating statistical significance.

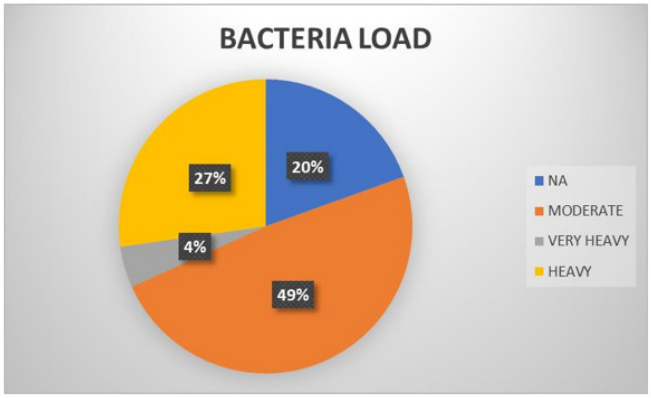


**Figure 3**: shows the percentage of the H-Pylori load amongst the patients.

**Table 5: Illustrates the Relationship between the H-Pylori Infection and Load. There is Statistically Significant Evident.**

| | | BACTERIA LOAD | | | | | |
|---|---|---|---|---|---|---|---|
| **Variable** | **Category** | **NA** | **Moderate** | **Very Heavy** | **Heavy** | **Total** | **P-Value** |
| **BACTERIA STATUS** | **Negative** | 210(99.5) | 1(0.5) | 0(0.0) | 0(0.0) | 211(100) | <.001 |
| | **Positive** | 54(4.7) | 658(57.7) | 61(5.3) | 368(32.3) | 1141(100) | |
| | **Total** | 264(19.5) | 659(48.7) | 61(4.5) | 368(27.2) | 1352(100) | |

**Table 6: Shows the Relationship between the H-Pylori Infection and Laboratory Diagnosis. The P-value Shows that there is Statistically Significant**

| | | Lab Diagnosis | | | | | |
|---|---|---|---|---|---|---|---|
| **Variable** | **Category** | **Normal** | **Chronic Gastritis** | **Mild Chronic** | **Severe Chronic** | **Total** | **P-Value** |
| **BACTERIA STATUS** | **Negative** | 43(20.4) | 16(7.60) | 145(68.7) | 7(3.30) | 211(100) | <.001 |
| | **Positive** | 3(0.3) | 222(19.5) | 555(48.6) | 361(31.6) | 1141(100) | |
| | **Total** | 46(3.4) | 238(17.60) | 700(51.7) | 368(27.30) | 1352(100) | |

## H. pylori Activity and Metaplasia

Patients with intestinal metaplasia were more likely to have an active H. pylori infection.

This suggests that monitoring patients with intestinal metaplasia is crucial due to the increased risk of progression to gastric cancer. A p-value of <0.001 indicating statistical significance.

**Table 7: Shows the Relationship between the H-Pylori Infection Activity in Patients and the Presence of Metaplasia**

| | | METAPLASIA STATUS | | | |
|---|---|---|---|---|---|
| **Variable** | **Category** | **No** | **Yes** | **Total** | **P-Value** |
| **Activity** | No | 1005(89.0) | 124(11.0) | 1129(100) | **<.001** |
| | Yes | 179(80.3) | 44(19.7) | 223(100) | |
| | Total | 1184(87.6) | 168(12.4) | 1352(100) | |

## Discussion

A total of one thousand three hundred and fifty-two (1352) individuals with symptomatic disease were investigated in this retrospective study, 84.3% of these patients tested positive for H.pylori infection. Our findings are consistent with fellow developing countries.5,11Reports from Western (Ibadan), North central (Keffi) and Eastern (Enugu) Nigeria had prevalence rates way above the average global prevalence rate [11, 12].

Inoculation of the macrobacterium is usually acquired in early childhood and has been linked to poor living conditions and poor sanitation. All these are associated with low socio – economic status which is the condition found in developing countries. This explains the reasons for high prevalence rates in these regions [13-16].

The high prevalence of H. pylori infection across all age groups, with positivity rates ranging from 80% to 87%, indicates that this infection is a common public health concern. The highest positivity rate in the 51-60 years age group suggests that older adults may be at greater risk, potentially due to cumulative exposure over time [17]. Data is comparable to a study conducted in Calabar with mean prevalence age distribution between 41-60 years [18].

Ananya et. al., 2012 suggested that prostaglandin levels in the gastric mucosa are reduced in elderly patients, resulting in diminished epithelial cell turnover rate and cellular repair. This puts elderly patients at higher risks for complicated H pylori disease [12].

A majority of patients were H. pylori positive, with no statistically significant difference between males and females ($p = 0.63$). This finding aligns with previous studies indicating that other factors, such as socioeconomic status, hygiene practices, and environmental exposures, may play a more critical role in the transmission and acquisition of H. pylori infection than sex alone [19]. This was contrary to other reports which found a higher prevalence of H.pylori infection in their female patients [20, 21]. Whereas, Bello et al found a male preponderance for H.pylori infection among their patients [22]. The lack of sex predilection for H.pylori infection in both sexes in our study could be as a result of a common risk of acquiring the infection in both genders.

The regional analysis of H. pylori prevalence revealed significant disparities, with the Oshana region exhibiting the highest number of cases (543 patients). The statistically significant difference in diagnoses across regions ($p < 0.001$) underscores the importance of regional factors in the epidemiology of H. pylori infection. Apart from factors already mentioned, population density has been observed to be an important determinant of H. pylori prevalence. Studies conducted in Nigeria observed that those patients living in a high-density populated area or in an overcrowded environment had the highest number of isolates 252 (51.75%), while the least cases were from those living in a low-density populated area 86 (17.66%) [12].

Helicobacter pylori infection is a major public health concern and has been implicated in the pathogenesis of gastric and duodenal ulcer as well as gastric mucosa–associated lymphoid tissue (MALT) lymphoma, and adenocarcinoma [17]. Host genetics, bacterial traits and environmental features have been proven to influence the clinical outcome of the infection. The association between intestinal metaplasia and active gastritis is particularly concerning, as the presence of metaplasia is considered a precancerous condition [14]. The significantly higher proportion of patients with active gastritis among those with metaplasia suggests a critical need for monitoring and management of these patients to prevent progression to gastric cancer [23]. The absence of patients with gastric cancer in this study is reassuring; however, it underscores the importance of early detection and intervention

in at-risk populations. The statistically significant difference in gastritis activity between patients with and without metaplasia ($p < 0.001$) emphasizes the need for regular endoscopic surveillance and appropriate management strategies [24, 25].

## Limitation

This study was limited by the relatively small, regionally – based sample size that may not accurately represent national prevalence rates. Additionally, essential patient data, including medical, family and social history – such as alcohol consumption, smoking and a family history of gastric malignancies – were not documented. The inclusion of these variables could have provided valuable insights into risk factors for complicated H. pylori disease.

## Conclusion

This study highlights the significant burden of H. pylori infection across various demographics and clinical presentations. The presence of intestinal metaplasia in 12.4% of the studied population warrant intense surveillance and appropriate management to prevent progression to gastric malignancy. Further research is needed to assess the molecular strains and resistance profiles in Namibia.

## References


1. Schulz C, Schütte K, Mayerle J, Malfertheiner P (2019) The role of the gastric bacterial microbiome in gastric cancer: Helicobacter pylori and beyond. Therapeutic advances in gastroenterology 12: 1756284819894062.
2. Asaka M, Sepulveda AR, Sugiyama T, Graham DY (2001) Gastric Cancer. Helicobacter pylori: Physiology and Genetics.
3. Elbehiry A, Marzouk E, Aldubaib M, Abalkhail A, Anagreyyah S, et al. (2023) Helicobacter pylori Infection: Current Status and Future Prospects on Diagnostic, Therapeutic and Control Challenges. Antibiotics (Basel, Switzerland) 12: 191.
4. Birato Y, Masimango B, Delphin M Katabana, Tony A Shindano (2023) Risk factors of Helicobacter pylori infection in Bukavu, Democratic Republic of the Congo: a case–control study. Ann Med Surg (Lond) 85: 727-731.
5. Odigie AO, Adewole AJ, Ekunwe AA (2020) Prevalence and factors associated with Helicobacter pylori infection among treatment naïve dyspeptic adults in University of Benin Teaching Hospital, Benin City, Nigeria. Afr J Clin Exper Microbiol 21: 97–105.
6. Correa P (1992) Human gwastric carcinogenesis: a multistep and multifactorial process—first American Cancer Society award lecture on cancer epidemiology and prevention. Cancer research 52: 6735-6740.
7. Seeger AY, Ringling MD, Zohair H, Blanke SR (2020) Risk factors associated with gastric malignancy during chronic Helicobacter pylori Infection. Medical research archives 8: 2068.
8. William D Chey, Benjamin C Y Wong (2007) American College of Gastroenterology guideline on the management of Helicobacter pylori infection. Am J Gastroenterol 102: 1808-1825.
9. Dore MP, Pes GM, Bassotti G, Usai-Satta P (2016) Dyspepsia: When and How to Test for Helicobacter pylori Infection. Gastroenterol Res Pract 2016: 8463614.
10. Shatila M, Thomas AS (2022) Current and Future Perspectives in the Diagnosis and Management of Helicobacter pylori Infection. Journal of clinical medicine 11: 5086.
11. Adeniyi B, Otegbayo J, Lawal T, Oluwasola A, Odaibo G, et al. (2012) Prevalence of Helicobacter pylori infection among dyspepsia patients in Ibadan, South West Nigeria. African journal of microbiology research 6: 3399-3402.
12. Ezugwu RI, Chukwubike C (2014) Epidemiology of Helicobacter pylori infection among dyspepsia patients in South-East, Nigeria. IOSR Journal of Pharmacy and Biological Sciences 9: 53-56.
13. Blaser MJ, Atherton JC (2004) Helicobacter pylori persistence: biology and disease. Journal of Clinical Investigation. J Clin Invest 113: 321-333.
14. Wroblewski LE, Peek RM, Wilson KT (2024) Helicobacter pylori and Gastric Cancer: Factors That Modulate Disease Risk. Clin Microbiol Rev 23: 713.
15. Piscione M, Mazzone M, Di Marcantonio MC, Muraro R, Mincione G (2021) Eradication of Helicobacter pylori and Gastric Cancer: A Controversial Relationship. Front Microbiol 12: 630852.
16. Narayanan M, Reddy KM, Marsicano E (2018) Peptic Ulcer Disease and Helicobacter pylori infection. Mo Med 115: 219-224.
17. Adlekha S, Chadha T, Krishnan P, Sumangala B (2013) Prevalence of helicobacter pylori infection among patients undergoing upper gastrointestinal endoscopy in a medical college hospital in kerala, India. Annals of medical and health sciences research 3: 559-563.
18. Kooffreh-Ada M, Okonkwo U, Emmanuel U, Aniekan E, Chukwudike E, et al. (2019) Prevalence of Helicobacter pylori infection among dyspepsia patients in Calabar. Global Journal of Pure and Applied Sciences 25: 145.
19. Kumurya A (2015) Serological Detection of Helicobacter pylori Antibodies in Patients Suffering from Gastric Symptoms in Kano, Nigeria. American Journal of Health Research 3: 352.
20. Seyi Samson E, John Okeleke O, Yomi Richard A, Taiwo Gideon F, Lydia Olutoyosi A, et al. (2018) Screening for Helicobacter Pylori Infection among Undergraduate Students of a Tertiary Institution using serum Antibody and Stool Antigen Detection Methods. Biomedical Journal of Scientific & Technical Research 3: 001–10.
21. Jemikalajah J, Okogun GRA (2014) Health point prevalence of helicobacter pylori in central hospital Warri, Nigeria. African Journal of Cellular Pathology 3: 57-60.
22. Bello AK, Umar AB, Borodo MM (2018) Prevalence and Risk Factors for Helicobacter Pylori Infection in Gastroduodenal Diseases in Kano, Nigeria. African Journal of Medical and Health Sciences 17: 41-46.
23. Seeger AY, Ringling MD, Zohair H, Blanke SR (2022) Risk factors associated with gastric malignancy during chronic Helicobacter pylori Infection. Med Res Arch 8: 2068.
24. Smith SI, Ajayi A, Jolaiya T, Onyekwere C, Setshedi M, et al. (2022) Helicobacter pylori Infection in Africa: Update of the Current Situation and Challenges. Digestive Diseases 40: 535–44.
25. Sukri A, Hanafiah A, Mohamad Zin N, Kosai NR (2020) Epidemiology and role of Helicobacter pylori virulence factors in gastric cancer carcinogenesis. APMIS 128: 150–161.