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Relationship between *Helicobacter Pylori* Infection and Iron Deficiency Anemia among Pregnant Women Attending Muhammad Abdullahi Wase Teaching Hospital, Kano State

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Abstract

Helicobacter pylori infection during pregnancy has been associated with iron deficiency anemia (IDA), hyperemesis gravidarum, miscarriage, pre-eclampsia, fetal growth restriction, and other adverse pregnancy outcomes. Despite the high prevalence of *H. pylori* infection in Kano State, Nigeria, information on its relationship with anemia among pregnant women remains limited. This study investigated the prevalence of *H. pylori* infection and its association with iron deficiency anemia among pregnant women attending Muhammad Abdullahi Wase Teaching Hospital, Kano, Nigeria. A hospital-based cross-sectional study was conducted among 50 pregnant women attending the antenatal clinic of Muhammad Abdullahi Wase Teaching Hospital, Kano. Socio-demographic, clinical, and obstetric data were collected using a structured questionnaire. Venous blood samples were collected into ethylenediaminetetraacetic acid (EDTA) tubes for packed cell volume (PCV) determination. *H. pylori* infection was detected using a rapid serological test kit for anti-*H. pylori* IgG antibodies. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 17.0. Associations between categorical variables were assessed using Chi-square and Fisher's exact tests, with statistical significance set at $p < 0.05$. The seroprevalence of *H. pylori* infection was 42.0% (21/50), while the prevalence of anemia (PCV <30%) was 32.0% (16/50). An equal proportion of anemic respondents were *H. pylori* seropositive and seronegative (50.0% each). Among non-anemic women, 61.8% were *H. pylori* seronegative, whereas 38.2% were seropositive. No statistically significant association was observed between *H. pylori* infection and anemia ($\chi^2 = 0.67$, $p = 0.41$). Similarly, socio-demographic characteristics, gestational age, interpregnancy interval, and iron supplement intake were not significantly associated with *H. pylori* infection ($p > 0.05$). Of the clinical symptoms evaluated, only headache and cold sensation showed significant associations with *H. pylori* infection ($p < 0.05$). This

study demonstrated a relatively high seroprevalence of *H. pylori* infection among pregnant women in Kano. However, no significant association was found between *H. pylori* infection and anemia. The relatively low prevalence of anemia observed in the study population may be attributable to regular iron supplementation during pregnancy and adequate interpregnancy spacing. Larger studies employing more sensitive diagnostic methods and comprehensive iron status biomarkers are recommended to further elucidate the relationship between *H. pylori* infection and iron deficiency anemia in pregnancy.

Introduction

Helicobacter pylori infection has been recognized as one of the most common chronic bacterial infections in humans, infecting more than half of the population of the world. The overall prevalence is high in developing countries. *H. pylori* infection is a global problem, but its prevalence varies from country to country (Hunt et al., 2011). *H. pylori* infection is acquired in early childhood and becomes a chronic infection if left untreated. The majority of infected people remain asymptomatic, and only a small portion develops illness, usually in adulthood (Cover et al., 2009). Also, *H. pylori* infection during pregnancy is linked to iron deficiency anemia, fetal abnormalities, miscarriage, pre-eclampsia, and fetal growth limitation, in addition to gastrointestinal issues such as hyperemesis gravidarum (HG). Severe iron deficiency anemia during pregnancy increases the risk of premature birth (when delivery occurs before 37 complete weeks of pregnancy). Iron deficiency anemia during pregnancy is also associated with having a low-birth-weight baby and postpartum depression (Kibru et al., 2014). Some studies also revealed that in African Countries, iron deficiency anemia and *H. pylori* infection affect pregnancies (Karaer et al., 2008 & WHO, 2011), which leads to blood loss and related disease. This study aimed to determine the relationship between *Helicobacter pylori* infection and iron deficiency anemia among pregnant women.

Methodology

Population and Eligibility

The study population comprised pregnant women attending antenatal care services at Muhammad Abdullahi Wase Teaching Hospital during the study period. Eligible participants were those who had been receiving antenatal care follow-up at the facility and who consented to participate in the study after adequate counselling.

Before data collection, informed written consent was obtained from each participant. Ethical approval for the study was obtained from the Kano State Ministry of Health Research Ethics Committee.

Sample Collection

A total of 50 participants were recruited for the study. All procedures involving sample collection, processing, and analysis were carried out under the supervision of a trained and experienced laboratory technologist.

Venous blood samples were collected from each participant for the determination of hematocrit (packed cell volume, PCV), hemoglobin concentration, and Helicobacter pylori testing. All samples were properly labelled, packaged, and transported to the laboratory under appropriate conditions for further microbiological and hematological analysis.

Sample Analysis

The collected blood samples were first analyzed for packed cell volume (PCV). Capillary tubes were filled with blood samples, sealed using a sealer, and centrifuged in a microhematocrit centrifuge for 5 minutes. After centrifugation, the PCV values were read and recorded using a microhematocrit reader (Tadesse et al., 2014).

Helicobacter pylori infection was determined using a rapid diagnostic test kit. One drop of whole blood was applied to the sample well of the test device, followed by two drops of buffer solution. The

specimen reacted with antigen-coated particles in the test strip and migrated chromatographically along the membrane, where it interacted with immobilized anti-human IgG antibodies.

A positive result was indicated by the appearance of two-colored lines (test and control lines), while a negative result was indicated by the presence of a single control line only, indicating the absence of detectable H. pylori antibodies (Tadesse et al., 2014).

Statistical Analysis

The data collected were coded, entered, and organized into appropriate tables and subsequently analyzed using the Statistical Package for the Social Sciences (SPSS) version 17.0. Descriptive statistics, including frequencies and percentages, were used to summarize the data. Associations between categorical variables were assessed using the Chi-square test of independence or Fisher's exact test where appropriate. Statistical significance was set at $p < 0.05$.

Results

Socio-Demographic Characteristics of Respondents

A total of 50 participants were enrolled in the study. The highest proportion of participants, 21 (42.0%), were within the age group of 23–27 years, followed by 14 (28.0%) in the 28–32 years age group and 9 (18.0%) in the 18–22 years age group. The remaining participants were aged 33 years and above.

Most of the participants, 41 (82.0%), resided in urban areas, while 9 (18.0%) lived in rural areas. Regarding marital status, the majority, 49 (98.0%), were married, whereas only 1 (2.0%) was divorced.

With respect to educational attainment, 21 (42.0%) participants had a tertiary education, 17 (34.0%) had a secondary education, 3 (6.0%) had a primary education, and 9 (18.0%) had no formal education. In terms of occupation, most of the participants, 43 (86.0%), were unemployed, while 7 (14.0%) were employed.

These findings indicate that the study population was predominantly composed of married, urban-dwelling women with tertiary or secondary education, the majority of whom were unemployed (Table 1).

Table 1: Socio-Demographic Characteristics of the Respondents

Parameters	Frequency	Percentages
Age (Years)		
18 – 22	9	18.0
23 – 27	21	42.0
28 – 32	14	28.0
33 – 37	3	6.0
38 – 42	2	4.0
43 – 47	1	2.0
Total	50	100.0
Residence		
Rural	9	18.0
Urban	41	82.0
Total	50	100.0
Marital Status		
Divorced	1	2.0
Married	49	98.0
Total	50	100.0
Educational Level		
Informal	9	18.0
Primary	3	6.0
Secondary	17	34.0
Tertiary	21	42.0
Total	50	100.0
Occupation		
Employed	7	14.0
Unemployed	43	86.0
Total	50	100.0

Obstetric Characteristics and Iron Supplement Intake among Respondents

The majority of the participants, 37 (74.0%), were in their second trimester of pregnancy, while 7 (14.0%) were in the third trimester and 6 (12.0%) were in the first trimester.

Regarding the interval between pregnancies among multigravida women, 35 (70.0%) reported an interpregnancy interval of more than two years, whereas 15 (30.0%) reported an interval of less than two years.

With respect to iron supplementation, 33 (66.0%) participants reported regular intake of iron tablets

during pregnancy, while 17 (34.0%) reported irregular or no intake of iron supplements.

Overall, the findings indicate that most participants were in the second trimester of pregnancy, had an interpregnancy interval exceeding two years, and regularly consumed iron supplements during pregnancy (Table 2).

Table 2: Obstetric Characteristics and Iron Supplement Intake of Respondents

Parameters	Frequency	Percentages
Gestation Period		
First	6	12.0
Second	37	74.0
Third	7	14.0
Total	50	100.0
Interpregnancy Gap for Multigravida		
Less than 2 years	15	30.0
More than 2 years	35	70.0
Total	50	100.0
Iron Pills Taken During Pregnancy		
Yes	33	66.0
No	17	34.0
Total	50.0	100.0

Distribution of Reported Clinical Symptoms and Packed Cell Volume (PCV) Respondents

Table 3 shows the distribution of reported clinical symptoms among the study participants. Out of the 50 participants enrolled in the study, weakness was the most commonly reported symptom, affecting 26 (52.0%) participants. Fatigue and headache were each reported by 25 (50.0%) participants, while dizziness was reported by 21 (42.0%) participants.

Fifteen (30.0%) participants reported experiencing cold sensations, and an equal proportion, 15 (30.0%), reported shortness of breath. Pale skin was the least commonly reported symptom, occurring in 5 (10.0%) participants.

Based on packed cell volume (PCV) measurements, 16 (32.0%) participants were classified as anaemic, whereas 34 (68.0%) had normal PCV values (Table 3).

Table 3: Reported Clinical Symptoms and Packed Cell Volume (PCV) Among Respondents

Symptom	Frequency	Percentages
Cold		
Yes	15	30.0
No	35	70.0
Total	50	100.0
Fatigue		
Yes	25	50.0
No	25	50.0
Total	50	100.0
Weakness		
Yes	26	52.0
No	24	48.0
Total	50	100.0
Dizziness		
Yes	21	42.0
No	29	58.0
Total	50	100.0
Headache		
Yes	25	50.0
No	25	50.0
Total	50	100.0
Pale Skin		
Yes	5	10.0
No	45	90.0
Total	50	100.0
Shortness of Breath		
Yes	15	30.0
No	35	70.0
Total	50	100.0
Packed Cells Volume		
Anemic	16	32.0
Normal	34	68.0
Total	50	100.0

Prevalence of *Helicobacter pylori* Infection Among Respondents

Table 4 shows that the overall prevalence of *Helicobacter pylori* infection among pregnant women attending the antenatal clinic of Muhammad Abdullahi Wase Teaching Hospital was 42.0% (21/50).

Table 4: Prevalence of *Helicobacter pylori* Among Respondents

H. pylori	Frequency	Percentages
Positive	21	42.0
Negative	29	58.0
Total	50	100.0

Association between Socio-demographic Characteristics and *H. pylori* Infection Status

The present study found no statistically significant association between socio-demographic characteristics and *Helicobacter pylori* infection among pregnant women attending Muhammad Abdullahi Wase Teaching Hospital, Kano. Specifically, age, place of residence, marital status, educational level, and occupation were not significantly associated with *H. pylori* infection status (Table 5).

Although the highest proportion of infection was observed among respondents aged 23–32 years, age was not significantly associated with *H. pylori* infection ($p = 0.767$).

Association between Obstetric Characteristics, Iron Supplement Intake, and *H. pylori* Infection Status

Table 6 presents the association between obstetric characteristics, iron supplement intake during pregnancy, and *Helicobacter pylori* infection among the respondents. No statistically significant associations were observed between *H. pylori* infection and any of the variables examined.

Gestational period was not significantly associated with *H. pylori* infection ($\chi^2 = 1.08$, df = 2, $p = 0.58$). Although the highest proportion of infected respondents was observed among women in the second trimester (66.7%), the differences across gestational periods were not statistically significant.

Similarly, no significant association was found between interpregnancy gap and *H. pylori* infection among multigravida respondents ($\chi^2 = 0.18$, df = 1, $p = 0.67$). Respondents with an interpregnancy gap of more than two years accounted for a higher proportion of positive cases (66.7%); however, this difference was not statistically significant.

Iron supplement intake during pregnancy was also not significantly associated with *H. pylori* infection ($\chi^2 = 0.82$, df = 1, $p = 0.366$). Although a greater proportion of *H. pylori*-negative respondents reported taking iron supplements during pregnancy (72.4%) compared with *H. pylori*-positive respondents (57.1%), the observed difference was not statistically significant.

Overall, gestational period, interpregnancy gap, and iron supplement intake during pregnancy were not significantly associated with *H. pylori* infection among the study participants ($p > 0.05$).

Association between Presented Clinical Symptoms and *H. pylori* Infection among Respondents.

The association between clinical symptoms and *H. pylori* infection is shown in Table 7. A statistically significant association was observed between *H. pylori* infection and the presence of **cold** ($\chi^2 = 5.67$, df = 1, $p = 0.017$) and **headache** ($\chi^2 = 6.86$, df = 1, $p = 0.009$). Respondents reporting a cold and a headache had significantly higher proportions of H. pylori positivity than those without these symptoms.

No significant associations were found between *H. pylori* infection and **fatigue** ($p = 0.777$), **weakness** ($p = 0.532$), **dizziness** ($p = 0.206$), **pale skin** ($p = 0.380$), or **shortness of breath** ($p = 0.655$).

Association between PCV and *Helicobacter pylori* Infection Status among Respondents

There was no statistically significant association between packed cell volume status and *H. pylori* infection among the respondents ($\chi^2 = 0.67$, df = 1, $p = 0.41$), as shown in Table 8. Although the prevalence of *H. pylori* infection was higher among anaemic respondents (50.0%) than among those with normal packed cell volume (38.2%), the difference was not statistically significant ($p > 0.05$).

Discussion

This study examined the prevalence of *Helicobacter pylori* infection and its relationship with iron deficiency anaemia (IDA) among pregnant women attending Muhammad Abdullahi Wase Teaching Hospital, Kano. The overall *H. pylori* seroprevalence recorded was 42.0% (21/50). This

figure is consistent with the global burden of *H. pylori* infection, which affects more than half of the world's population and is disproportionately prevalent in low- and middle-income countries (Hooi et al., 2017).

Table 5: Association Between Socio-Demographic Characteristics and *H. pylori* Infection Status

Variable	No. Examined	*H. pylori* Infection Status		Test	df	p-value
		Positive n (%)	Negative n (%)			
Age (Years)						
18–22	9	4 (19.1)	5 (17.4)	$\chi^2 = 2.56$	5	0.767
23–27	21	7 (33.3)	14 (48.3)			
28–32	14	7 (33.3)	7 (24.1)			
33–37	3	2 (9.5)	1 (3.4)			
38–42	2	1 (4.8)	1 (3.4)			
43–47	1	0 (0.0)	1 (3.4)			
Residence						
Rural	9	6 (28.6)	3 (10.3)	$\chi^2 = 2.91$	1	0.088
Urban	41	15 (71.4)	26 (89.7)			
Marital status						
Divorced	1	1(4.8)	0(0.0)	Fisher's exact	—	0.42
Married	49	20(95.2)	29(100)			
Education						
Informal	9	5 (23.8)	4 (13.8)	$\chi^2 = 2.25$	3	0.52
Primary	3	2 (9.5)	1 (3.4)			
Secondary	17	7 (33.3)	10 (34.5)			
Tertiary	21	7 (33.3)	14 (48.3)			
Employment						0.40
Employed	7	4(19.1)	3(10.3)	$\chi^2 = 0.72$	1	
Unemployed	43	17 (81.0)	26 (89.7)			

Table 6: Association between Obstetric Characteristics, Iron Supplement Intake, and *Helicobacter pylori* Infection Status among Respondents

Variable	No. Examined	*H. pylori* Infection Status		χ^2	df	p-value
		Positive n (%)	Negative n (%)			
Gestational Period						
First Trimester	6	3 (14.3)	3 (10.3)	1.08	2	0.58
Second Trimester	37	14 (66.7)	23 (79.3)			
Third Trimester	7	4 (19.0)	3 (10.3)			
Total	50	21 (100)	29 (100)			
Interpregnancy Gap						
< 2 Years	15	7 (33.3)	8 (27.6)	0.18	1	0.67
≥ 2 Years	35	14 (66.7)	21 (72.4)			
Total	50	21 (100)	29 (100)			
Iron Supplement Intake						
Yes	33	12 (57.1)	21 (72.4)	0.82	1	0.366
No	17	9 (42.9)	8 (27.6)			
Total	50	21 (100)	29 (100)			

Table 7: Association between Clinical Symptoms and *H. pylori* Infection Status among Respondents.

Symptom	No. Examined	*H. pylori* Infection Status		χ^2	df	p-value
		Positive n (%)	Negative n (%)			
Cold						
Yes	15	10 (66.7)	5 (33.3)	5.67	1	0.017*
No	35	11 (31.4)	24 (68.6)			
Fatigue						
Yes	25	11 (44.0)	14 (56.0)	0.08	1	0.777
No	25	10 (40.0)	15 (60.0)			
Weakness						
Yes	26	12 (46.2)	14 (53.8)	0.39	1	0.532
No	24	9 (37.5)	15 (62.5)			
Dizziness						
Yes	21	11 (52.4)	10 (47.6)	1.60	1	0.206
No	29	10 (34.5)	19 (65.5)			
Headache						
Yes	25	15 (60.0)	10 (40.0)	6.86	1	0.009*
No	25	6 (24.0)	19 (76.0)			
Pale Skin						
Yes	5	3 (60.0)	2 (40.0)	0.77	1	0.380†
No	45	18 (40.0)	27 (60.0)			
Shortness of Breath						
Yes	15	7 (46.7)	8 (53.3)	0.20	1	0.655
No	35	14 (40.0)	21 (60.0)			

Table 8: Packed Cell Volume and H. pylori Infection Status

Packed Cell Volume (%)	*H. pylori* Infection Status		Total	χ^2	df	p-value
	Positive n (%)	Negative n (%)				
Anemic (<30%)	8 (50.0)	8 (50.0)	16			
Normal (30–40%)	13 (38.2)	21 (61.8)	34			
Total	21 (42.0)	29 (58.0)	50	0.67	1	0.41

In the African context, seroprevalence rates exceeding 70–80% have been documented in countries such as Egypt and the Gambia, while lower rates of 20–30% have been reported in high-income settings such as Australia, Japan, and much of Western Europe (Eslick et al., 2002; Karaer et al., 2008). The 42.0% prevalence observed in the current study is higher than that reported in most developed countries but falls below the very high figures documented in some other sub-Saharan African and developing-country settings, a pattern previously noted in Nigerian studies (Smith et al., 2018; Ugwu et al., 2025).

Within northern Nigeria, the present finding aligns closely with the seroprevalence of approximately 40–44% reported among patients with gastric symptoms in Kano (Kumurya, 2015) and the 42.4% prevalence recorded in a related Nigerian context (Smith et al., 2018). A more recent systematic review and meta-analysis of *H. pylori* infection in Nigeria noted a declining trend over time, with studies conducted between 2015 and 2024 reporting a pooled prevalence of approximately 36%, suggesting ongoing variability in transmission across different Nigerian populations (Babah *et a*l., 2024). The comparatively moderate seroprevalence observed in the present study may reflect the urban-dominated composition of the study population (82.0% urban residents), since urban dwelling generally confers some advantage

in terms of access to clean water, improved sanitation, and hygienic food handling—all recognised determinants of *H. pylori* transmission (Kao et al., 2016). Similarly, Isa *et a*l. (2015) reported a seroprevalence of approximately 43% among pregnant women in Maiduguri, northeastern Nigeria, a figure comparable to our finding and consistent with the overall endemic burden of *H. pylori* in northern Nigeria.

The socio-demographic analysis revealed no statistically significant association between *H. pylori* infection and variables including age ($p = 0.767$), place of residence ($p = 0.088$), marital status ($p = 0.42$), educational level ($p = 0.52$), and occupation ($p = 0.40$). These findings are consistent with previous Nigerian studies. Smith et al. (2018) similarly reported that age, place of residence, and educational level were not significant predictors of *H. pylori* acquisition in a multi-centre Nigerian population. Ugwu et al. (2025) likewise found no significant association between socio-demographic factors and *H. pylori* seroprevalence among pregnant women in Onitsha, southeastern Nigeria. The absence of a significant age association is biologically plausible: since *H. pylori* is predominantly acquired during childhood in endemic settings and persists as a chronic infection if untreated, its distribution across reproductive-age women is expected to be relatively uniform (Kao et al., 2016). The non-significant residence finding, despite a higher observed proportion among rural residents (28.6% vs 71.4% urban positivity), likely reflects the equalising influence of common environmental exposures such as shared water sources and household crowding, that transcend the rural–urban divide in resource-limited settings (Smith et al., 2018).

Concerning obstetric characteristics, no statistically significant association was observed between *H. pylori* infection and gestational period ($p = 0.58$), interpregnancy gap ($p = 0.67$), or iron supplement intake ($p = 0.366$). These findings indicate that *H. pylori* infection status is not modulated by trimester of pregnancy, birth spacing, or prophylactic iron use, at least within the sample size examined. This finding is broadly consistent with the observation of Ugwu et al. (2025), who also reported that the gestational period did not significantly predict *H. pylori* seropositivity among Nigerian pregnant women. The non-significant association with iron supplementation is noteworthy. Although a higher proportion of *H. pylori*-seronegative women reported regular iron supplementation (72.4%) compared with seropositive women (57.1%), the difference did not achieve statistical significance, which may be attributed to the relatively small sample size and the cross-sectional nature of the study design.

Among the clinical symptoms evaluated, only cold sensations ($\chi^2 = 5.67$, $p = 0.017$) and headache ($\chi^2 = 6.86$, $p = 0.009$) were significantly associated with *H. pylori* infection status. Other symptoms, including fatigue, weakness, dizziness, pale skin, and shortness of breath, were not significantly associated with infection. The association between *H. pylori* infection and headache is consistent with growing evidence linking the infection to extragastric neurological manifestations. The gut–brain axis, a well-described bidirectional communication pathway between the gastrointestinal tract and the central nervous system, has been proposed as a mechanistic basis for this association (Moayyedi et al., 2017). Systemic subclinical inflammation induced by *H. pylori* and its associated proinflammatory cytokines may trigger neurological responses, including headache and migraine (Yadav et al., 2024). Multiple systematic reviews have confirmed an association between *H. pylori* and migraine and primary headache disorders, with resolution of headache following successful eradication therapy in some patients (Gravina et al., 2018). The significant association between cold sensations and *H. pylori* infection is less commonly reported in the literature and may reflect the broader systemic immune response elicited by the infection, including altered thermoregulation secondary to chronic low-grade inflammation (Yadav et al., 2024). The absence of significant associations for classic anaemia-related symptoms such as fatigue, weakness, dizziness, and pale skin may partly be explained by the clinical overlap of these symptoms with normal physiological changes of pregnancy,

which may have attenuated their discriminatory value in this population.

The primary objective of this study was to evaluate the relationship between *H. pylori* infection and anaemia as determined by packed cell volume (PCV) measurement. The results showed no statistically significant association between *H. pylori* seropositivity and anaemic status ($\chi^2 = 0.67$, df = 1, p = 0.41). Although the prevalence of *H. pylori* infection was numerically higher among anaemic respondents (50.0%) than among those with normal PCV values (38.2%), this difference was not statistically significant, suggesting that *H. pylori* infection alone may not be a sufficient determinant of anaemia in this population. This finding differs from studies that have reported a significant association between *H. pylori* and IDA, particularly in populations not receiving iron supplementation. Several proposed mechanisms link *H. pylori* infection to impaired iron homeostasis: the bacterium-induced hypochlorhydria reduces gastric acid secretion necessary for the solubilisation and absorption of non-haem dietary iron; *H. pylori* competes directly with the human host for available luminal iron through specialised outer membrane iron-uptake systems; and the infection elevates gastric lactoferrin, an iron-binding protein, which sequesters iron away from erythropoietic tissues (Motupalli & Oroszi, 2024; Aydın et al., 2022). Additionally, *H. pylori*-induced upregulation of hepcidin, the master regulator of systemic iron metabolism, further suppresses intestinal iron absorption and inhibits iron recycling from macrophages, thereby contributing to functional iron deficiency even in the presence of adequate iron stores (Motupalli & Oroszi, 2024).

The non-significant association between *H. pylori* infection and anaemia in the present study is likely explained by the high proportion of participants (66.0%) receiving regular iron supplementation as part of routine antenatal care. Prophylactic iron supplementation has been shown to substantially attenuate the risk of anaemia in pregnancy, with evidence suggesting that optimal supplementation can reduce maternal anaemia at term by up to 70% (Peña-Rosas et al., 2015). Consequently, the masking effect of iron supplementation on the expected association between *H. pylori* and IDA is a plausible explanation. This is consistent with a pilot clinical trial in which *H. pylori*-infected anaemic pregnant women treated with concurrent iron supplementation showed haematological improvement regardless of eradication therapy, suggesting that iron supplementation alone can partially overcome the haematological impact of *H. pylori* infection (Rustgi et al., 2011). Furthermore, the overall anaemia prevalence of 32.0% recorded in this study, while lower than the national average of approximately 47–50% reported for Kano State pregnant women (Babah et al., 2024; NDHS, 2018), reinforces the beneficial effect of regular iron supplementation in the study cohort. The interpregnancy gap of more than two years reported by the majority (70.0%) of participants may also have contributed to the relatively low anaemia burden, as adequate inter-birth spacing reduces the cumulative iron depletion associated with repeated closely-spaced pregnancies (WHO, 2011).

The study has several limitations that should be considered in interpreting these findings. The sample size of 50 participants is relatively small, which reduces statistical power and limits the ability to detect modest associations. The use of a rapid serological diagnostic kit detects anti-*H. pylori* IgG antibodies, which cannot distinguish between active current infection and prior resolved infection, potentially resulting in an overestimation of true active infection prevalence. Additionally, the diagnosis of IDA was based solely on PCV values without accompanying serum ferritin, serum iron, or total iron-binding capacity measurements, which are the gold standard for confirming iron deficiency; this may have led to imprecise classification of iron-deficiency-related anaemia. Future studies with larger sample sizes, more sensitive diagnostic modalities such as the urea breath test or stool antigen assay for *H. pylori*, and comprehensive iron status panels, are warranted to more definitively characterise the relationship between *H. pylori* infection and anaemia in pregnancy in this population.

Conclusion

This study documented an *H. pylori* seroprevalence of 42.0% among pregnant women attending antenatal care in Kano, reflecting the endemic burden of this infection in northern Nigeria. No statistically significant association was observed between *H. pylori* infection and anaemia in this cohort, most likely due to the protective effect of routine iron supplementation and adequate interpregnancy spacing. Headache and cold sensations were the only clinical symptoms significantly associated with *H. pylori* infection, supporting the extragastric manifestations of the infection via the gut–brain axis. These findings underscore the importance of continued adherence to antenatal iron supplementation programmes in northern Nigeria and highlight the need for larger, well-designed studies that incorporate confirmatory diagnostic methods and comprehensive iron biomarker panels to establish the definitive relationship between *H. pylori* infection and iron deficiency anaemia in pregnant women in this region.

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Conflict of Interest

The authors declare that they have no conflict of interest regarding the publication of this paper.

Author Contributions

FAR Conceptualization of the research idea, data collection, and conduct of the laboratory experiments. SLI Study supervision, methodological guidance, critical review of the manuscript, and mentorship throughout the research process. RII Manuscript revision, critical review, and intellectual input into the final version of the manuscript. SIA Data management, statistical analysis. HAB Preparation of tables and figures. All authors read and approved the final version of the manuscript and agreed to be accountable for all aspects of the work.

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