Seroprevalence of *Helicobacter pylori* among Sudanese Gastritis Patients

Nazar A. Osman, Ahmed A. Ahmed, Mushera Ahmed, and Tagwa Osman

*Faculty of Medical Laboratory Sciences, Al Neelain University, Khartoum, Sudan*

**Abstract**

**Background:** *Helicobacter pylori* (*H. pylori*) infection is one of the most common chronic bacterial infection affecting humans. Previous seroepidemiologic studies showed about 50% of the adult population in developed countries and nearly 90% of those in developing countries were seropositive for *H. pylori*.

**Objective:** To investigate the seroprevalence of *Helicobacter pylori* among Sudanese gastritis patients.

**Materials and methods:** 68 patients with symptoms of gastritis attending the Modern Medical Center (Khartoum) were investigated serologically for *H. pylori* infection, using the immunochromatographic assay (ICA) test. A control group of 62 healthy individuals were similarly investigated as a comparative group.

**Results:** *H. pylori* reactivity among gastritis patients was higher (63.2%) than that of the healthy control group (45.2%). The sero-positivity gender incidence of *H. pylori* was higher among males (33.1%) than among females (22.3%).

**Conclusion:** *H. pylori* sero-positivity was higher among gastritis patients than healthy individuals. At the same time, (ICA) test was considered a possible diagnostic technique for diagnosis of *H. pylori* infection among gastritis patients.

**Key words:** *Helicobacter pylori*, Gastritis patients, Immunochromatographic assay.

**Introduction**

*H. pylori* is a microaerophilic gram negative spiral-shaped bacterium which is causally related to chronic active gastritis, peptic ulcer disease, primary low-grade B-cell gastric lymphoma, and gastric carcinoma. Epidemiological studies have revealed an association of *H. pylori* seroprevalence with old age, lower socioeconomic status, and crowdedness in housing. Gastritis is one of the commonest conditions in most Sudanese outpatient departments. Although a number of epidemiological studies have suggested a higher prevalence of *H. pylori* infection in Sudanese gastritis patients, there is a dearth of data on the prevalence and risk factors for *H. pylori* infection in Sudan.

Osman, et. al, 2016: Vol 1(6)
patients with gastritis, only few high quality therapeutic trials had specifically investigated the role of *H. pylori* in the causation of dyspepsia. The majority of dyspeptic patients are difficult to diagnose, and may need several empirical therapeutic trials, or more specific diagnostic assessments\(^2\).

Recent studies in Sudan showed that the overall prevalence of *H. pylori* infection in patients with gastritis, assessed by different diagnostic methods, was around 69%. There is no published information concerning the relationship between *H. pylori* infection and patients with gastritis and asymptomatic Sudanese patients. This study was conducted in a Sudanese setting to ascertain the importance of *H. pylori* infection in gastritis and asymptomatic patients.

**Materials and methods**

This was a qualitative, cross sectional, comparative study conducted at the Modern Medical Center (Khartoum). The study population was gastritis patients and healthy individuals as a control group. Sampling was a non-probability, convenience type. Sample size was 68 gastritis patients and 62 healthy individuals admitted to the study as a control group. Data were collected by a structural interview questionnaire and age and gender of all subjects investigated were recorded. The objectives of the study were verified to all patients and their consent was obtained. A permission to conduct the investigations was endorsed by authorities of the Modern Medical Center. Two ml venous blood were collected from gastritis patients and healthy, control individuals. This was accomplished by using sterile disposable syringes and plain blood containers. Sera were obtained by allowing blood to clot, then centrifuged and preserved at 2-8°C until (ICA) test was performed.

The Biomedical Product Company “*H. pylori One Step Test Device*” was used. The principle of the test is based on an immunoassay reaction for detection of *H. pylori* IgG antibodies in serum. The anti-human IgG is immobilized in the test-line region of the device. The serum sample was mixed with a coated-particle *H. pylori* antigen. This mixture migrates chromatographically along the length of the test strip and interacts with the antibody in the serum.

The test was started by allowing serum specimens and test devices to equilibrate at room temperature. Then the test device was removed from its foil and placed on a flat, dry surface, and at a vertical position, a dropper was held on the test disk. Then 3 drops of serum sample were squeezed into the sample well of the test device. After 10 minutes the result was read as follows:

a) Positive result: Presence of two red bands (Test band and Control band) within the result window regardless which band appears first.

b) Negative result: Presence of one red band appearing in Control band only.

Data were analyzed by SPSS programme, and statistics were used to compare level of association between *H. pylori* gastritis and other similar conditions. The sensitivity of the diagnostic test was identified as percent of true positive samples that is expressed as:

\[
\frac{\text{True positive samples by diagnostic method} \times 100}{\text{True positive} + \text{False negative}}
\]

**Osman, et. al, 2016: Vol 1(6)**
The specificity of the diagnostic test was identified as percent of true negative samples that is expressed as:

\[
\text{True negative samples by diagnostic method} \times \frac{100}{\text{True negative + False negative}}
\]

**Results**

The seropositivity of *H. pylori* antibodies among symptomatic gastritis patients was 63.2%. At the same time, the seropositivity of *H. pylori* antibodies among asymptomatic control group was 45.2%. Subjects in both test and control groups were in the age range 20-50 years. Most gastritis patients (32.6%) were in the age range 30-39 years. Also most control group individuals (59.7%) were in the age range 20-29 years. On the other hand 27 males (81.8%) were found positive among the symptomatic gastritis patients, while 16 males (42.1%) were found positive among the control group (Table I).

<table>
<thead>
<tr>
<th>Reactivity</th>
<th>Gastritis group</th>
<th>Control group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Positive</td>
<td>27 (81.8%)</td>
<td>20 (57.1%)</td>
<td>16 (42.1%)</td>
</tr>
<tr>
<td>Negative</td>
<td>6 (18.2%)</td>
<td>15 (42.9%)</td>
<td>22 (57.9%)</td>
</tr>
<tr>
<td>Total</td>
<td>33 (100%)</td>
<td>35 (100%)</td>
<td>38 (100%)</td>
</tr>
</tbody>
</table>

**Discussion**

*Helicobacter pylori* infection is related to gastric ulcer and gastric carcinoma. Cancer of the distal stomach and the intestinal diffuse types are strongly associated with *H. pylori* colonization\(^2\). This organism causes chronic active inflammation of the gastric mucosa in the majority of colonized subjects. In a considerable number of them, this will eventually lead to a loss of gastric glands and thus the establishment of atrophic gastritis, which is associated with the development of intestinal metaplasia and dysplasia\(^2\). *H. pylori* infection may be easily diagnosed by histological examination, rapid urease test or culture performed on gastric biopsies taken during endoscopy. For non-invasive monitoring of *H. pylori* Osman, *et al.* 2016: Vol 1(6)
infection, the 13 C-urea breath test has significantly higher accuracy than serology\(^3\). Laboratory diagnosis of \(H.\ pylori\) infection may be confirmed by latex commercial serological tests. The sensitivity of these tests is about 90\%\(^3\).

The seropositivity is higher in male patients than in female patients (Table I). This conforms with other reports noting a high existence among men\(^4\). On the other hand, seropositivity of \(H.\ pylori\) antibodies among symptomatic gastritis patients was 63.2\%; while seropositivity of \(H.\ pylori\) antibodies among control group entered in this study was 45.2\%. This high difference explains the frequent occurrence of gastric symptoms in association with \(H.\ pylori\) infection.

Rapid serological tests are cheap, readily available and simple to use in the clinical setting. However, local evaluation is essential in order to validate these techniques. In many infections the IgG subclass response has been shown to correlate with the severity of the infection and disease outcome. It was suggested that IgG subclass response in patients infected with \(H.\ pylori\) may be a marker of gastritis and ulcer disease as well as increased levels of inflammation\(^8\).

In our study 68 symptomatic gastritis patients were investigated by a rapid ICA serological test. Statistical analysis made in this study compared the level of association between gastritis caused by \(H.\ pylori\) and other similar symptoms and signs. The sensitivity and specificity of the diagnostic test were more than 90\%. The overall seroprevalence of \(H.\ pylori\) infection in this study was 39-63\%. This is in agreement to that reported in other developing countries\(^5\). However, there are reports from other parts of the world with lower sero-prevalence of \(H.\ pylori\) infection\(^6\).

The low seroprevalence in our study may be attributed to differences in study area, subjects investigated, sample size, or elimination of \(H.\ pylori\) infection as a result of antibiotic treatment in occasion of concomitant diseases, such as giardiasis, amoebiasis, and respiratory diseases\(^7\). The seroprevalence of \(H.\ pylori\) infection increases with increase in age worldwide\(^8\). In our study, this increase pattern was exhibited partly among the symptomatic gastritis group but not among the control group. Most individuals (62.3\%) enrolled in the present study, were males. The seropositivity of \(H.\ pylori\) among gastritis patients was higher among males (81.8\%) than females (57.1\%) as shown in Table I. This pattern is different from that reported by other workers who found no difference in the prevalence of infection between both gender\(^9\). This difference in seroprevalence of \(H.\ pylori\) infection between males and females may be related to higher exposure of males to potential environmental sources of infection.

Conclusion: \(H.\ pylori\) sero-positivity was higher among gastritis patients than healthy individuals. At the same time, ICA test was considered a possible diagnostic technique for diagnosis of \(H.\ pylori\) infection among gastritis patients. All patients complaining of gastritis symptoms need to be subjected for \(H.\ pylori\) antibody testing. In cases of chronic gastritis the reactivity of \(H.\ pylori\) is diagnostic. All contacts of gastritis patients must be screened by \(H.\ pylori\) IgG antibody testing.

References


\textbf{Osman, et.al, 2016: Vol 1(6)}

**Osman, et.al, 2016: Vol 1(6)**