Helicobacter Pylori Associated Ulcerative Infections among Patients Attending Madonna University Teaching Hospital, Elele, Rivers State

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Abstract

The investigation of faecal occult blood and Helicobacter Pylori associated gastro-intestinal symptoms in Madonna University teaching Hospital, Elele, Rivers State, was carried out between June 2010 and January 2011. Seventy eight (78) faecal samples were collected and analysed using established repaid diagnostic faecal tests. The findings revealed that 32 (41%) and 11 (14.1%) samples were positive for faecal occult blood and H. pylori tests respectively. On the gender differences, there was no statistical difference (p > 0.05) between male and female patients studied. There was also no difference (p > 0.05) between those ulcer patients caused by H. pylori and other associated factors. This study therefore suggests that the possible cause of most gastric ulcers among patients in Elele and environs in Rivers State is linked to H. pylori. Proper environmental sanitation and education on social behaviour are pivotal to check transmission

Keywords: faecal occult blood, helicobacter pylori, ulcer patients, rivers

INTRODUCTION

Gastric ulceration is the process of ulcer formation where there is a break in the tissues lining the stomach. Majority are associated with the presence of the bacterium Helicobacter pylori, other factors could be genetic predisposition, drugs such as non-steroidal anti inflammatory drugs (NSAIDS), alcohol and smoking (Brooker, 2003).

Helicobacter pylori causes a chronic low-level inflammation of the stomach lining and is strongly linked to the development of duodenal and gastric ulcers and stomach cancer (Suerbaum and Machetti, 2002). More than 50% of the world’s population harbour H. pylori in their upper gastrointestinal tract (Yamaoka and Yoshio, 2008). It contains hydrogenase used to obtain energy. It also produces oxidase, catalase and urease. It is capable of forming biofilms and can convert from spiral to a possibly visible but non-cultural coccoid form both likely to favour its survival and can be factors in the epidemiology of the bacterium. The Lophotrichous flagellation makes it to be highly motile (Josenhans et al; 2000). H. pylori, through chemotaxis moves away from the acidic environment of the lumen towards the more neutral pH environment of the epithelhel surface (Kusters et al; 2006). It produces adhesions which bind to membrane associated lipids and carbohydrates and help it adhere to epithelhel cells.

The urease produced by H. pylori breaks down urea (which is normally secreted into the stomach) to carbon dioxide and ammonia and the ammonia is converted to ammonium by taking a proton (H+) from water, which leaves only a hydroxyl ion, producing bicarbonate which neutralizes gastric and this accounts for the survival of H. pylori in the acidic stomach (Smoot, 1997). Transmission of H. pylori is through oral means of faecal matter through the ingestion of waste-tainted water. Person-to-person transmission is either by oral-oral or faecal-oral route is most likely as the bacterium can be isolated from saliva, faeces and plaque of some infected people. (Brown, 2000).

This study is aimed at establishing whether the prevalence of gastritis in Elele and the surrounding community is due to Helicobacter pylori.

MATERIALS AND METHODS

Area of the Study

This study was carried out in the University Community of the Teaching Hospital, Elele in Rivers state, Nigeria. Elele is a town with a relatively poor hygiene and climatic conditions in which most of its population attend the hospital with complaints of gastrointestinal symptoms.
Sample Collection/Analysis
The patients with symptoms were requested to produce stool samples after 3 days of abstinence from meat and iron tablets. This was to ensure that metabolites and products of heam were excluded before the test. Faecal Occult blood and *H. pylori* faecal antigen tests were carried out simultaneously as to check if *Helicobacter pylori* is the causative agent of gastritis.

Rapid Diagnostic Faecal Antigen Test for *H. pylori*
*H. pylori* antigen Rapid test result window has 2 pre-coated line “T” (*H. pylori* Ag test line) and “C” (control line). Both the test line and the control line in result window are not visible before applying any samples. The control line is used for procedural control and should always appear if the test procedure is performed correctly.

Test device and extracted samples were allowed to room temperature prior to testing. The assay diluent was taken to fill the marked line which was then transferred into the sample collection tube. This later procedure was repeated and a portion of faeces about (50mg) was taken with the sample collected swab. This faecal swab was then inserted into the collection tube containing assay diluent and then swirled ten times. This was to ensure complete dissolution of faecal material into the assay diluent. This was allowed to settle in the tube for 5 minutes. 3 drops (about 100 1) of this assay faecal solution was added into the sample well of the test devices. Result is interpreted at 10 – 15 minutes by the appearance of purple colour moving across the result window in the centre of the test device (Krausse et al; 2008)

Faecal Occult Blood Test (FOB)
A small quantity (about 50mg) faecal matter was taken into the extraction buffer and mixed thoroughly. Gentle pressure was applied on the tip of this extraction buffer bottle to remove it. Half of this mixture was added into a collection tube. The FOB test strip was then inserted into the mixture which was allowed to stand for 30 seconds. Test and control lines were not visible before application. If the procedure was properly carried out, the control lines always appear.

This method was adapted from Acon Biotech (Haogzhou Co. Ltd). The result is interpreted at 3-5 minutes by the appearance of purple colour. The results of the tests were subjected into statistical analysis using chi-square test and Yates correction (Fisher and Yates, 1974).

RESULTS
The findings from this study revealed that of the 78 patients screened for gastrointestinal symptoms, 32 (41%) were faecal occult blood positive while 11(14.1%) were infected with the bacterium – *H. pylori*. On the gender differences in infection rates, it was found that 21 males and 11 females were occult blood positive and 7 and 4 were *H. pylori* positive for males and females respectively. These evaluations were drawn from the rapid diagnostic tests for the detection of FOB and *H. pylori* as seen in table 1.

Gender differences for either of the diagnostic tests indicated almost equal rate of infection. Positive and negative results are also presented in table 2 and 3. Table 4 compares the infections of FOB and *H. pylori* tests FOB gave 32 positive, 46 negative, *H. pylori* showed 11 patients positive, 67 negative.

DISCUSSION
This study revealed that most of the patients screened for FOB and *H. pylori* and who had gastro-intestinal disturbances did not show any positive result indicating that most people who have complaints of gastritis-like symptoms should require more evaluation. It is also instructive that irritation in the stomach including *H. helmannii, H. felis, H. rappini, H. cinaedi, H. sp Hills, cytomegalovirus and mycoplasma and Helicobacter species have been isolated from the stomach of dogs, cats, ferrets, pigs, monkeys and cheetahs, birds, mice, chicken (Liddel and Scott, 1966; Yamaoka and Yoshio, 2008; Brown, 2000).

These germs also grow in the saliva, so they can be transmitted between family members and pets. Most patients who were FOB positive were *Helicobacter pylori* negative. The reason was that about 23 species of Helicobacter (Brown, 2000) which test does not detect may be the causative agents. There was no statistical difference (p > 0.05) between the rate of infection among males and females. The mode of transmission of *H. pylori* particularly in early childhood due to poor sanitary or environmental hygiene may be a factor as well as equal level of social practices of oral-to-oral contact between males and females (Brown, 2000). The rate of infections of FOB and *H. pylori* did not differ significantly (p > 0.05) which suggests that the cause of most gastric ulcers is due to the bacterium-*Helicobacter pylori* which agrees with the observations of Suerbaum and Michetti (2002).

In conclusion, the emergence of *Helicobacter pylori* associated gastrulceration and their non detectability of most species in the routinely done tests has resulted to treatment failures and misdiagnosis. Our findings strongly underlines the need for vigilance and repeated surveillance. We also recommend concerted efforts in re-engineering in the species identification through genetic or molecular levels.
Table 1: Rapid diagnostic tests for the detection of Faecal Occult Blood and H. pylori

<table>
<thead>
<tr>
<th>Gender</th>
<th>Positive</th>
<th>Negative</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>21</td>
<td>25</td>
<td>7</td>
<td>39</td>
</tr>
<tr>
<td>Female</td>
<td>11</td>
<td>24</td>
<td>4</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>34(41%)</td>
<td>46(59%)</td>
<td>11(14.1%)</td>
<td>67(85.9%)</td>
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</tbody>
</table>

Table 2: Gender Contingency table for Faecal Occult Blood

<table>
<thead>
<tr>
<th>Gender</th>
<th>Positive</th>
<th>Negative</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>21 (18.9)</td>
<td>25 (27.1)</td>
<td>46</td>
</tr>
<tr>
<td>Female</td>
<td>11 (13.1)</td>
<td>21 (18.9)</td>
<td>32 p &gt; 0.05</td>
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<tr>
<td>Total</td>
<td>32</td>
<td>46</td>
<td>78</td>
</tr>
</tbody>
</table>

Table 3: Gender Contingency table for H. Pylori

<table>
<thead>
<tr>
<th>Gender</th>
<th>Positive</th>
<th>Negative</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>7 (6.5)</td>
<td>39 (39.5)</td>
<td>46</td>
</tr>
<tr>
<td>Female</td>
<td>4 (4.5)</td>
<td>28 (27.5)</td>
<td>32 p &gt; 0.05</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>67</td>
<td>78</td>
</tr>
</tbody>
</table>

Table 4: Comparison of Faecal Occult Blood and H. Pylori Infection

<table>
<thead>
<tr>
<th>Gender</th>
<th>Positive</th>
<th>Negative</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>32 (21.5)</td>
<td>46 (56.5)</td>
<td>78</td>
</tr>
<tr>
<td>Female</td>
<td>11 (21.5)</td>
<td>67 (56.5)</td>
<td>78 P &gt; 0.05</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>113</td>
<td>156</td>
</tr>
</tbody>
</table>

- Value in parenthesis is the expected value
- The Numerical value without parenthesis is the observed value.

REFERENCES


