Breastfeeding and *Helicobacter Pylori* Infection in Children with Digestive Symptoms

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Abstract

**Objective:** This study aims to evaluate the role of breastfeeding in the acquisition of *Helicobacter pylori* (*H. pylori*) infection in Iran and to compare the histopathologic changes occurring in children feeding on breast milk with those in infants feeding on formula.

**Methods:** In a case-control study parents of children with and without *H. pylori* infection who had undergone endoscopic survey and gastric biopsy in the Children’s Medical Center, Tehran, were asked about their feeding practices during the first 6 months after birth, the duration of breastfeeding period, the symptoms, and the duration of symptoms and concomitant diseases.

**Findings:** A total of 154 children were included in this study. From this sample, 77 children formed the case group and 77 children formed the control group. A significant difference was found between *H. pylori* infection and feeding with formula (*P*=0.045). In case group, a significant difference was found between breastfeeding and age of the infected child (*P*=0.034), shorter duration of symptoms (*P*=0.016), and finally degree of *H. pylori* colonization (*P*=0.021).

**Conclusion:** It appears that breastfeeding in the first 6 months after birth can decrease the degree of *H. pylori* colonizaton, postpone infection until older age, shorten the duration of symptoms, and be concomitant with milder gastritis.

*Key Words:* Breastfeeding; Gastritis; *Helicobacter pylori*; Formula

Introduction

*Helicobacter pylori*, a gram negative bacillus, is recognized as the main etiological agent of several gastroduodenal diseases including peptic ulcer and gastric malignancies. Breastfeeding, while providing protection against many...
Infective agents, can facilitate the acquisition of \(H. \text{pylori}\) infection. This infection occurs as a result of the close contact between breastfeeding child and the infected mother.

Some studies have shown breastfeeding’s protective effect against the acquisition of \(H. \text{pylori}\) infection\(^{[1-4]}\). Contrastingly, other studies have reported that breastfeeding does not have a protective effect against the acquisition of \(H. \text{pylori}\) infection\(^{[5-7]}\). Furthermore, these studies have suggested that breastfeeding can even increase the rate of infection, especially in children breastfed for longer than 6 months\(^{[8]}\). Such different results might stem from the differences in the social and cultural practices of breastfeeding. Despite this plausible explanation, no studies have yet explored the role of breastfeeding in the acquisition of \(H. \text{pylori}\) infection in Iran and also most studies did not pay attention to histopathological changes in stomach. Therefore, this study aimed to evaluate the role of breastfeeding in the acquisition of \(H. \text{pylori}\) infection in Iran and to compare the histopathologic changes occurring in children feeding on breast milk and in those feeding on formula.

**Subjects and Methods**

This is a case-control study carried out from March 2007 to February 2009. Participants consisted of children aged 2-14 years who were diagnosed with digestive symptoms, especially abdominal pain and undergone endoscopic survey and gastric biopsy in the Children’s Medical Center. Patients with a history of chronic debilitating disease were excluded and all cases and controls suffered mainly from abdominal pain but were in good general condition according to weight, history and absence of chronic disease stigmata. Children whose breastfeeding status was unknown or feeding consisted of a mixture of breast milk and formula were excluded from the study. The \(H. \text{pylori}\) infection was detected by Gimsa staining of the gastric biopsy and scored by Boryshyang Sheu’s scoring\(^{[9]}\). Feeding practice was defined as breastfeeding exclusively in the first 6 months of life and formula feeding in this time period. Patients were placed in each group according to their history. We also conducted a pilot study in order to estimate the prevalence of formula consumption in Iran in infected and non-infected children by \(H. \text{pylori}\), and discovered that in infected children 33.3% and in children who were not infected 14% consumed formula. We used these findings to determine the volume of our case and control groups. Hence, our case group consisted of 77 consecutive children infected by \(H. \text{pylori}\) and the control group consisted of 77 consecutive children not infected by this germ. We also asked the parents about their breastfeeding practices during the first 6 months after birth, the duration of breastfeeding period, the symptoms, and the duration of symptoms and concomitant diseases.

In this study the Pearson’s \(\chi^2\) test and the Fisher’s exact test were both employed to assess the relationship between \(H. \text{pylori}\) infection and variables such as age, gender, kind of feeding, duration of breastfeeding, symptoms and signs, duration of symptoms and signs, concomitant diseases, histopathologic changes in the stomach, concomitant histopathologic changes and the degree of \(H. \text{pylori}\) colonization.

Statistical analysis was performed using SPSS 14 software (SPSS Inc., Chicago, IL, USA).

**Findings**

A total of 154 children were included in this study. From this sample, 77 children formed the case group (40 boys and 37 girls) and 77 the control group (42 boys and 35 girls). Children whose breastfeeding status was unknown or consisted of a mixture of breast milk and formula were excluded from the study.

Table 1 and 2 show gender, mean age, kind of feeding, duration of breastfeeding, symptoms and signs, concomitant diseases, histopathologic changes in the stomach, concomitant histopathologic changes and the degree of \(H. \text{pylori}\) colonization in the case and control groups.
Table 1: Gender, mean age, kind of feeding, duration of breastfeeding, symptoms and signs, concomitant diseases in the case and control groups

<table>
<thead>
<tr>
<th>Kind of feeding</th>
<th>Case group (HP positive)</th>
<th>Control group (HP negative)</th>
<th>Total</th>
<th>P value or Exact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breast milk</td>
<td>64 (83.1%)</td>
<td>72 (93.5%)</td>
<td>154</td>
<td>0.04¹</td>
</tr>
<tr>
<td>Formula</td>
<td>13 (16.9%)</td>
<td>5 (6.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>Female</td>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(HP positive)</td>
<td>31 (20.1%)</td>
<td>33 (21.4%)</td>
<td>72(46.75%)</td>
<td>0.7¹</td>
</tr>
<tr>
<td>(HP negative)</td>
<td>6 (3.9%)</td>
<td>7 (4.5%)</td>
<td>82(53.25%)</td>
<td></td>
</tr>
<tr>
<td>Mean age (year)</td>
<td>33 (21.4%)</td>
<td>39 (25.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>31 (20.1%)</td>
<td>6 (3.9%)</td>
<td>378</td>
<td>0.7¹</td>
</tr>
<tr>
<td></td>
<td>6 (3.9%)</td>
<td>7 (4.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of breast feeding (months)</td>
<td>15</td>
<td>11.75</td>
<td>0.4¹</td>
<td></td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>49</td>
<td>8</td>
<td>45</td>
<td>3</td>
</tr>
<tr>
<td>GI bleeding</td>
<td>3</td>
<td>0</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Vomiting</td>
<td>10</td>
<td>2</td>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>FTT</td>
<td>6</td>
<td>1</td>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>Presence of concomitant non-debilitating diseases</td>
<td>5</td>
<td>1</td>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>

¹ Pearson's χ² test
² Fisher's exact test

The more common gastric histopathologic changes in the case group were moderate gastritis (P=0.03), active gastritis (P=0.006) and follicular gastritis (P<0.001). More common histopathologic changes of stomach in control group were normal stomach (P<0.001) and mild gastritis (P=0.001).

There was no significant difference between case and control group in the duration of breastfeeding (P=0.4), sex (P=0.7), type of symptoms, concomitant diseases (Exact value=0.5), duration of symptoms (P=0.7), severe gastritis (Exact value=0.12), peptic ulcer (Exact value=1), esophagitis (P=0.4), duodenitis (P=0.676), duodenal villous atrophy (P=0.4), Giardia infection (Exact value=1) and duodenal ulcer (Exact value=1).

Discussion

Acquisition of *H. pylori* takes place within the first five years of life[10] and can produce severe inflammatory and immune responses, chronic gastritis, duodenal ulcer and mucosa-associated lymphoid tissue (MALT). Even though breastfeeding has a protective effect against the acquisition of *H. pylori* infection[1-4], while other studies have reported that breastfeeding does not have a protective effect against the acquisition of *H. pylori* infection[5-7]. Furthermore, these studies suggest that breastfeeding can even increase the rate of infection, especially in children breastfed for longer than 6 months[8]. This study was successful in determining the protective effect of breastfeeding history on *H. pylori* infection in...

我们研究的一个重要点是评估组织学变化并根据其严重程度将样本分为两组。这是在其他研究中未做过的。我们发现，更常见的是更严重的胃炎和更多的H. pylori组织（更多感染）在使用母乳喂养的儿童中，这可能由于乳铁蛋白效应，如上述所述，或者可能由于H. pylori特异性IgA在母乳中存在，而配方奶中缺乏[14]。

结论

我们的研究揭示了关于母乳喂养在预防H. pylori感染中的作用的重要信息。具体来说，母乳喂养在出生后6个月可能会降低感染程度，延迟到较晚的年龄，并可能缩短症状的持续时间，而且伴随较轻的胃炎。

因此，我们可以推荐母乳喂养作为可能的可靠方法来预防H. pylori感染的后果：胃炎，十二指肠溃疡和淋巴瘤。同样也要注意，母乳喂养可能有其他益处。
protective effect only in the first year of life and after that, it can increase *H. pylori* infection by facilitating mother-child transmission, especially if the mother doesn't have good hygienic habits.

To achieve more accurate results, it is recommended to do similar studies on a larger sample, which includes both healthy and infected children.

**Acknowledgment**

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**Conflict of Interest:** None

**References**