

Determine the Frequency of cagA and babA of Helicobacter Pylori Isolated from Gastric Atrophic Patients

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ABSTRACT

Objective: To determine the frequency of cagA and babA of helicobacter pylori isolated from gastric atrophic patients.

Study Design: Descriptive/analytical study

Place & Duration of Study: Department of Medicines, Chandka Medical College Hospital, Larkana and Khairpur Medical College, Khairpur Mirs from 1st April 2020 to 30th September 2020.

Methods: One hundred and twenty patients of both genders were presented in this study. Patients were aged between 20-80 years of age. Patients detailed demographics age, sex and body mass index were recorded after taking informed written consent. All patients of gastroduodenal disorders were undergone for isolation of bacteria by using standard techniques.

Results: Fifty (41.7%) patients were males and 70 (58.3%) patients were females. Mean age of the patients were 41.96±16 years with mean BMI 25.24±4.8 kg/m². Helicobacter pylori was isolated in 30 (25%) patients in which 13 patients had atrophic gastritis, 9 patients had gastric ulcer and 8 patients had acute gastritis. Frequency of cagA gene was 16 (53.4%) and babA was 10 (33.4%) in H. pylori isolated patients.

Conclusion: Different cagA positive H. pylori can be retrieved from gastric atrophy patients.

Keyword: Gastric atrophy, Gastric cancer, cagA, babA, Helicobacter pylori

INTRODUCTION

One of the most common infectious diseases worldwide is Helicobacter pylori infection.¹ This organism infects more than half of the world's population. It accompanied with severe pain in abdominal region. H. pylori has also been involved information of intestinal and duodenal lymphoma. A number of genes including vacA, cagA, cagE, iceA, babA and oipA, have been identified as significant causes for H. pylori pathogenesis.²⁻⁵ Highest virulence factor is reported in H. pylori with the cytotoxin-associated product (cagA), the vacuolating toxins (vagueA) and the adhesion protein babA2.⁴

Even out of these the most pivotal genes indicating to virulence are the cytotoxin-associated gene A (cagA) and blood group antigen-binding adhesin A (babA). babA is induced by contact with epithelium (iceA), cytotoxin-associated gene E (cagE).^{5,6} babA mediates binding activity between bacterial adhesin and human Lewis b blood group antigens present on the surface of gastric epithelial cells.⁵ The presence of interaction processes between BabA and Lewis b related antigens are the best defined adhesin-receptor interactions in H. pylori.⁷

Previous studies showed that Germans have high incidence of duodenal ulcers as well as H. pylori adherence.⁸ babA has also been included in the pathogenesis of extreme histological changes, such as atrophy or gut metaplasia.⁹⁻¹¹ The present study was aimed to compare virulence factors of H. pylori which were isolated patients for a better understanding of their virulence.

MATERIALS AND METHODS

This descriptive/analytical study was conducted at Department of Medicines, Department of Medicines,

Chandka Medical College Hospital, Larkana and Khairpur Medical College, Khairpur Mirs from 1st April 2020 to 30th September 2020 and comprised of 120 patients. After taking written consent, demographics including age, sex and body mass index were recorded. These patients who were previously treated with antibiotics, H2-receptor blockers, bismuth-containing compounds, H. pylori eradication therapy were excluded.

Patients were aged between 20 to 80 years. Each of the specimens was immediately put into the Stuart transport medium and shipped within 2 hours at 4°C to the laboratory. The specimens have been smeared on the surface with 10% horse serum, 10 mg/l vancomycin, 5 mg/l cerebrum and 5 mg/l amphotericin B. After this, they were incubated. Complete data was analyzed by SPSS 22.

RESULTS

There were 50 (41.7%) male patients and 70 (59.3%) female patients. Mean age of the patients was 41.96±16 years with mean BMI 25.24±4.8 kg/m².

Table 1: Baseline detailed demographics on enrolled cases

Variable	No.	%
Gender		
Male	50	41.7
Female	70	58.3
Mean age (yrs)	41.96±16	
Mean BMI (kg/m ²)	25.24±4.8	
Prevalence of H. pylori		
Yes	30	25.0
No	90	75.0

Frequency of H. pylori was isolated in 30 (25%) patients (Table 1). Among 30 (25%) patients of H. pylori isolated, 13 patients had atrophic gastritis, 9 patients had gastric ulcer and 8 patients had acute gastritis (Table 2). Frequency of

cagA gene was 16 (53.4%) and babA was 10 (33.4%) in *H. pylori* isolated patients (Table 3).

Table 2: Distribution of *Helicobacter pylori* isolated patients with respect to disease (n=30)

Variable	No.	%
Atrophic gastritis	13	43.3
Gastric ulcer	9	30.0
Acute gastritis	8	26.7

Table 3: Frequency of cagA and babA of *Helicobacter pylori* isolated (n=30)

Variable	No.	%
cagA gene	16	53.4
babA gene	10	33.4
Others	4	13.2

DISCUSSION

It is well known that *H. pylori* colonizes more than half of the world's human population.¹² Previous studies have documented that *H. pylori* isolated obtained from various parts of the world vary in the genotype and frequency of the vacA cagA gene. These differences of genotype influence the clinical presentation in patients infected with *H. pylori*. In many East Asian countries the presence of cagA is variable from a minimum of 50% in some Middle East⁹ to a maximum of 99%.^{13,14} cagA-positive *H. pylori* strains were found in 53.33% which less than the European and Northern American studies published (74% to 88%).¹⁵⁻¹⁷ In some trials, cagA has been suggested to be a useful marker for the most virulent strains of peptic ulcer, atrophic gastritis and adenocarcinoma.¹⁸

In the present study, the prevailing rates for babA were 33.3%, down from 57% in Colombia, and 73.7% in Costa Rica, 97.4% in Chile and 96.8% in Japan.¹⁹⁻²¹ The rate of incidence of babA2 was 71.6 percent in a report from Isfahan, Iran.²² babA2, which is curiously unconnected to clinical results, is the majority of *H. pylori* strains in Asia.²³ The frequency of the present study were similar to previous research.^{24,25} Dabiri et al⁶ indicated that cagA and cagE status or vacA genotypes had no clear correlation to clinical results. In non-ulcer dyspepsia, the oipA-positive strains were more common than in peptic ulcers.

A statistically significant association was observed in this analysis between aspA and babA ($p < 0.05$).²⁶ *H. pylori* has a large number of various adhesive components for binding carbohydrates. In primary colonization of *H. pylori*, the genes have a crucial and significant role. *H. pylori* gene proteins are also taking part in stable infections and development of chronic inflammation which directs to tissue damage.²⁷ The *H. pylori* virulence genes are linked to various stomach conditions such as 100% in gastric cancer, 86.7% in gastric ulcer, and 83.3% in gastritis and duodenal ulcer.²⁸

CONCLUSION

Different cagA and babA genes are positive for *H. pylori* can be retrieved from gastric atrophy patients.

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