

*Comparison of helicobacter pylori IgG & IgA
antibody levels in asymptomatic and symptomatic
children in Riyadh, Saudi Arabia*

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ABSTRACT

Helicobacter pylori (H. pylori) antibodies were determined in 229 asymptomatic children and 43 symptomatic children in Saudi Arabia. There is a significant difference in IgG and IgA antibodies for both asymptomatic and symptomatic children ($P = 0.00001$). We conclude that helicobacter pylori antibody determination by ELISA is a good screening test for diagnosis of helicobacter pylori infection in children in Saudi Arabia.

Key words : helicobacter pylori, antibodies, children, Saudi Arabia

Introduction

H. pylori is a spiral urease-producing organism nestled in the narrow interface between the gastric epithelial cell surface and the overlying mucus gel.⁽¹⁾ H. pylori has a worldwide distribution, however, social, cultural and environmental influences have a profound effect on the infection profile. Infection by this organism is now accepted as a major cause of antral gastritis and duodenal ulcer in children.^(2,3) H. pylori colonization results in a systemic IgG response^(4,5) and serology has been strongly advocated as a suitable means of screening patients.^(6,7) The development of a full systemic immune response to H. pylori can take several months following initial infection.⁽⁸⁾ As H. pylori infection in children is likely to be relatively recently acquired the systemic antibody response to this bacterium may not be fully established, particularly in younger subjects.⁽⁹⁾ Hence, for accurate diagnosis in children, seropositivity should be determined using sera from the local children rather than asymptomatic control sera. The aim of this study is to compare the levels of IgG and IgA H. pylori antibodies in asymptomatic and symptomatic children in Saudi Arabia.

Patients and Methods

The study was conducted prospectively on 229 asymptomatic childrens and 43 childrens with gastrointestinal symptoms like vomiting, chronic abdominal pain or chronic diarrhoea. The data collected include age, sex and growth parameter of the children. Blood were collected for H. pylori antibodies.

Both anti H. pylori IgG and IgA were done by Enzyme-linked Immunosorbent Assay as follow : blood samples were collected by venepuncture from patients and controls. The samples were allowed to clot and the serum separated by centrifugation. Serum samples were stored at -20°C until tested. Anti H. pylori IgG and IgA antibodies were measured in all samples using the HM-CAP H. pylori Immunoassay Kit (EPI - enteric products, incorporated). This kit uses a patented antigen which is a high molecular weight cell-associated protein (HM-CAP). The assay was performed as indicated in the procedures manual supplied. The absorbance was measured at 405 nm. Absorbance was converted to values by plotting a linear-log curve to determine sample values. A test is considered positive when the value is > 500 units. The sensitivity of the test was > 98.9% and specificity was > 95%. There is no cross reactivity of the HM-CAP Immunoassay with antibodies to C. jejuni, escherichia coli or C. fetus.

Results

We studied 229 asymptomatic children and 43 symptomatic children. The mean age for the asymptomatic children is 4.7 years (range 0.25 -12 years) with 120 males and 109 females. The mean age for the symptomatic children is 3.6 years (range 0.6 - 12 years) with 23 males and 20 females. Both asymptomatic and symptomatic children were of normal growth parameters. Mean \pm SD H. pylori IgG antibodies for asymptomatic and symptomatic group is 231 ± 130 , 475 ± 426 respectively, with *P* value of 0.00001. However, the mean \pm SD H. pylori IgA antibodies for the asymptomatic and symptomatic group is 167 ± 103 and 522 ± 341 respectively with *P* value of 0.00001 as shown in Table I and the Diagram.

Discussion

H. pylori is a well recognized cause of antral gastritis in children⁽⁹⁾ and also cause duodenal ulcer,⁽¹⁰⁾ both gastritis and duodenal ulcer cause abdominal pain in children⁽¹¹⁾

The diagnosis of H. pylori infection can be made by histological/cytological examination, culture of a gastric antral biopsy specimens and serological examinations.⁽¹²⁾ The advantage of serological test in serum is that it is cheap, non-invasive and reliable screening test in both developing and developed countries. Rocha et al.⁽¹³⁾ have shown that immunofluorescence test is a sensitive and specific test for detection of helicobacter pylori antibodies in children, also Blecker et al.⁽¹⁴⁾ have shown that ELISA test to be sensitive and specific. In our present study, we found a significant difference in both IgG and IgA antibodies for

H. pylori between asymptomatic children and children with gastrointestinal complaint. We conclude that serology for H. pylori is a useful screening test in children with chronic gastrointestinal symptoms and is a useful test in seroepidemiology of H. pylori infection in children.

References

1. Desforges JF. Helicobacter pylori and peptic ulcer disease. *N Eng J Med* 1991 ; 324 : 1043-8.
2. Prieto G, Polanco I, Larrauri J, et al. Helicobacter pylori infection in children : Clinical endoscopic and histologic correlations. *J Pediatr Gastroenterol Nutr* 1992 ; 14 : 420-5.
3. Hassal E, Demmick J. Unique features of helicobacter pylori disease in children. *Dig Dis Sci* 1991 ; 36 : 417-23.
4. Goodwin CS, Blincow E, Petersen G, et al. Enzyme-linked immunosorbent assay for campylobacter pylorides : Correlation with presence of C. pyloridis in the gastric mucosa. *J Infect Dis* 1987 ; 155 : 488-94.
5. Perez-Perez GI, Dworkin BM, Chodos JE, Blaser MJ. Campylobacter pylori antibodies in human. *Ann Intern Med* 1988 ; 109 : 11-7.
6. Sobala GM, Rathbone BJ, Wyatt JL, Dixon MF, Heatly RV, Axon ATR. Investigating young patients with dyspepsia. *Lancet* 1989 ; i : 60-1.
7. Morgan AG, Crabtree JE, Heatly RV, Goodwin PGR. Role of H. pylori serology in initial assessment patients with dyspepsia. *Gut* 1991 ; 32 : A 570.
8. Crabtree JE, Mahony MJ, Taylor JD, Heatly RV, Littlewood JM, Tompkins DS. Immune responses to helicobacter pylori in children with recurrent abdominal pain. *J Clin Pathol* 1991 ; 44 : 768-771.
9. Young CK, Fu KH, Yuen KY, et al. Helicobacter pylori and associated duodenal ulcer. *Arch Dis Child* 1990 ; 65 : 1212-6.

10. Drumm B, Sherman PH, Cutz E, Karmali M. Association of campylobacter pylori on the gastric mucosa with antral gastritis in children. *N Eng J Med* 1987 ; 316 : 1557-61.
11. Drumm B. Helicobacter pylori. *Arch Dis Child* 1990 ; 65 : 1278-82.
12. Chowdhury MMU, Chowdhury MNH, Laajam MA. Helicobacter pylori : It's clinical significance. *Med Sci Res* 1992 ; 20 : 503-6.
13. Rocha GA, Queroz DMM, Mendes EN, et al. Sero diagnosis of helicobacter pylori infection in children by an indirect immunofluorescence test. *J Pediatr Gastroenterol Nutr* 1993 ; 16 : 247-51.
14. Blecker U, Lanciers S, Hauser B, Vandenplas Y. Diagnosis of helicobacter pylori infection in adults and children by using the Mal Kit Helicobacter Pylori : A commercially available Enzyme-linked Immunosorbent Assay. *J Clin Microbiol* 1993 ; 31 : 1770-3.

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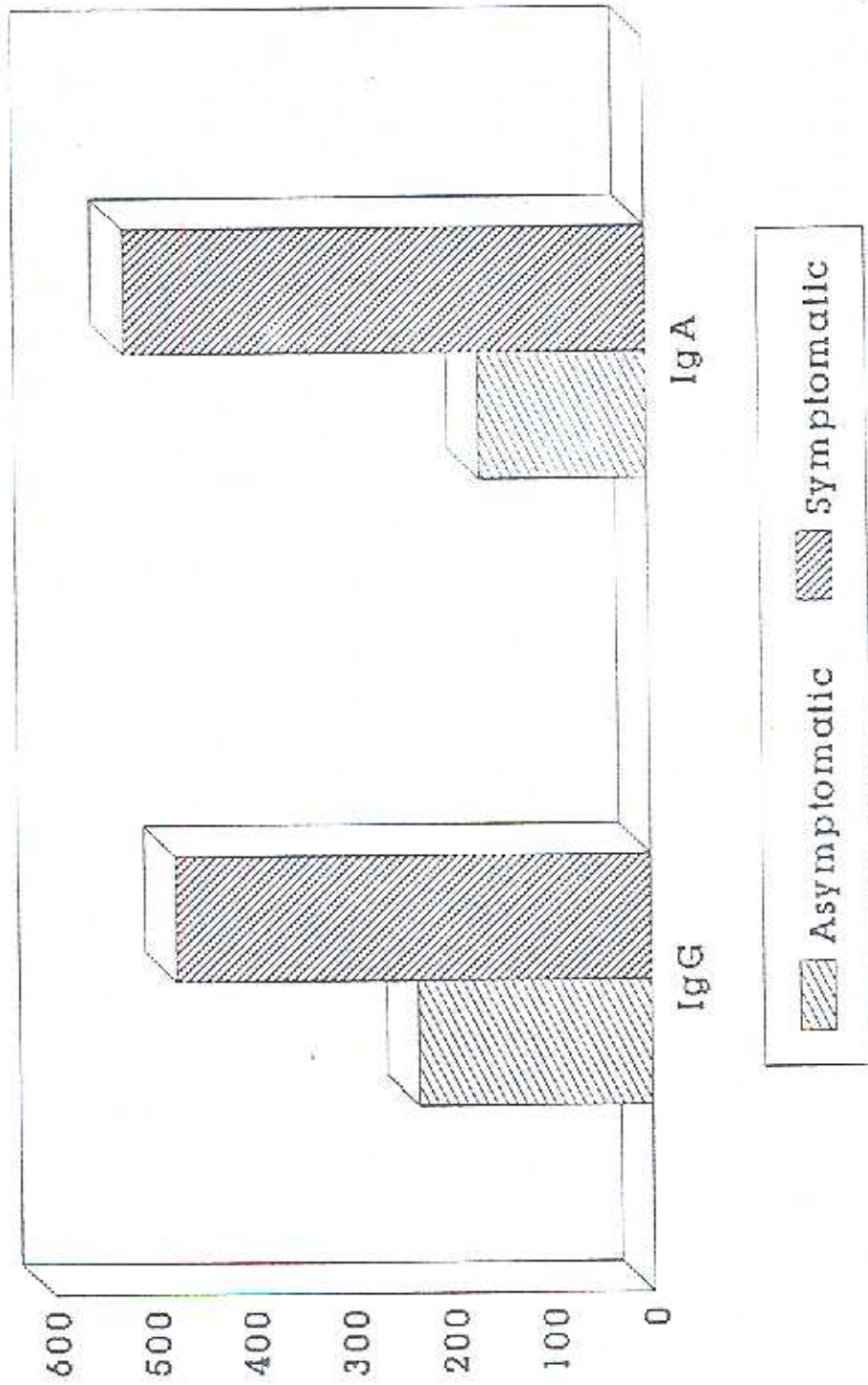
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Table I Mean helicobacter pylori antibodies in asymptomatic and symptomatic children.

	Asymptomatic Mean \pm S.D. N =229	Symptomatic Mean \pm S.D. N = 43	*P-value
IgG	231 \pm 130	475 \pm 428	0.00001
IgA	167 \pm 103	522 \pm 941	0.00001

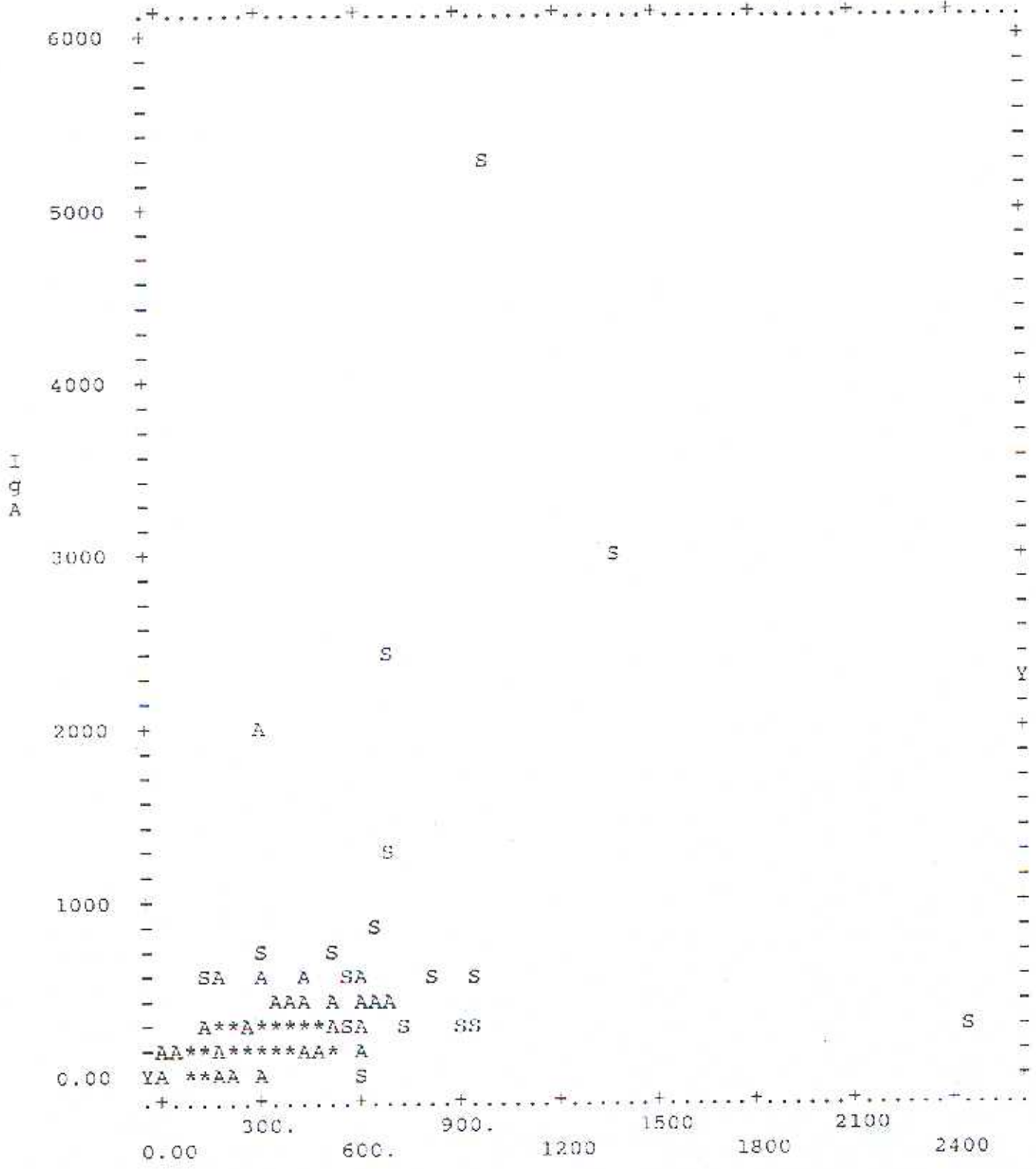
We used t-test for independent group to compare between two groups.

There was significant difference between the groups $P^* < 0.05$.



Mean Helicobacter Pylori antibodies in asymptomatic and symptomatic children

IgG VERSUS IgA (1 VS. 2) GROUP=ASYMPTOM, SYMBOL=A
 GROUP=SYMPTOMA, SYMBOL=S



R = .455
 P < .001

Mean Helicobacter Pylori antibodies in asymptomatic and symptomatic children