Int J Pharm Bio Sci 2015 April; 6(2): (B) 170 - 175

Research Article **Community medicine**

International Journal of Pharma and Bio Sciences **ISSN 0975-6299**

STUDIES ON HELICOBACTER PYLORI IN ASYMPTOMATIC CHILDREN

MOHANKUMAR PANDURANGAN

Department of Social and Preventive Medicine SHREE BALAJI MEDICAL COLLEGE AND HOSPITAL, CHROMPET, BHARAT UNIVERSITY.

ABSTRACT

This study has been planned to know the seroprevalence of Helicobacter pylori infection among children attending the paediatric department with complaints not related to gastro intestinal tract. Serum samples obtained from children of both sexes aged between 2 years to 16 years will be tested for anti - Helicobacter pylori antibodies of IgG class by quantitative ELIZA test. Results: It is observed that, female children acquired infection at an early age of 2-3 years while male children became infected only after 3 years. There is a steady increase in the age related sero prevalence among both the sexes and by the age of 12 years about 50 children of both sexes have acquired infection. Most of the seroprevalence children were from low socio-economic status .Conclusion: Helicobacter pylori is recognised as a risk factor for gastric carcinoma and lymphoma. Though the disease is acquired in childhood it is asymptomatic during childhood and produce manifestations in the later part of the life. As Helicobacter pylori infection is curable, an early diagnosis and treatment in childhood will prevent the late consequences of the disease in future life

KEY WORDS: Helicobacter pylori, seropevalence , duodenal ulcers, low socio economic status.

***Corresponding author**

MOHAN KUMAR
Department of Social and Preventive Medicine
SHREE BALAJI MEDICAL
COLLEGE AND HOSPITAL, CHROMPET, BHARAT *UNIVERSITY.*

INTRODUCTION

Globally during the recent past Helicobacter pylori has been recognised as the most common bacterium colonising the gastric mucosa of many individuals even from childhood, at some places[1]. Helicobacter pylori infection once acquired is believed to be persist throughout life, unless treated, and eventually in some subjects other co-existing risk factors will contribute to the development of gastric and duodenal ulcers The prevalence of Helicobacter pylori in children of developing countries is higher and begins at an early age than in developed countries[2]. Helicobacter pylori causes chronic active gastritis and is a major factor in the pathogenesis of duodenal ulcers. Helicobacter pylori resides in the overlying gastric mucus and do not invade the gastric epithelium. Gastric antrum is the commonest site of its colonisation , though any part of the stomach can be involved. It may also be located in the regions of tight junctions between adjacent mucosal epithelial cells. Once Helicobacter pylori infection occurs it results in a systemic as well as local immune response characterised by presence of specific IgG and IgA in serum and presence of secretory IgA and low levels of gastric IgM. This specific IgG seroconversion occurs within 22 to 33 days of infection. Further, there is no correlation between the antibody titer and the severity of the disease[3]. Major risk factor for acquiring this infection is low socio economic status. It is widely present in many developing countries including india, the overall prevalence in children has been reported to 45% because of over crowding and low socio economic conditions. In the light of the above , this study has been planned to know the seroprevalence of Helicobacter pylori infection among children attending the pediatric department with complaints not related to gastrointestinal tract and who have not received antibiotic treatment during the recent months.

MATERIALS AND METHODS

This is a cross-sectional study.Blood samples of 88 children of both sexes aged 2 to 16 years attending paediatric department , sree balaji medical college & hospital were collected. tested for Helicobacter pylori IgG specific antibodies were detected using Helicobacter pylori IgG Enzyme based immuno sorbent assay quantitative kit.

CRITERIA FOR SELECTION OF PATIENTS

1. Infants and children aged from 2 years to 16 years of both sexes were chosen for the study.
2. Children without any gastrointestinal tract symptoms were taken for the study.
3. Children on immunosuppressive drugs or with primary or secondary immune-supp – ression was excluded.
4. Children with history of taking any antibiotics, H2 Blockers or proton pump inhibitors in the preceding month were excluded.

Principle of the assay. The Helicobacter pylori IgG Enzyme immune sorbent assay is an indirect ELIZA for detection of Helicobacter pylori specific IgG antibodies in human serum. Microtiter strip wells are coated with purified Helicobacter pylori antigen. The diluted patient serum is incubated in a microtiter strip well and Helicobacter pylori specific antibodies will bind to the immobilised antigen.After removing the unbound serum components by washing with rinsing buffer, peroxidase labelled anti human IgG is dispensed into the well and will complex to the immobilised Helicobacter pylori specific IgG. Unbound conjugate is then removed by washing with rinsing buffer. Substrate is added to the wells and colour will develop proportionally to the amount of immobilised Helicobacter pylori specific IgG. If sulphuric acid is added to the reaction, colour development occurs which can be quantified by measuring absorbance at 450 nm.

RESULTS

Table 1
Helicobacter pylori sero prevalence among children studied

Age group	Total positivity
2-3 years	23.5
4-6 years	47
7-12 years	56.4
13-16 years	46.66
Total	43.3225

From the above table it can be seen that among 50 male children studied, the seroprevalence of Helicobacter pylori in the age group of 2-3 years is 12.5% out of 8 samples tested. Likewise in the age group of 4-6 years is 40%out of the samples tested. In the age group of 7-12 years it is 52% out of 25 samples and in 13-16 years of age it is 42% out of 7 samples tested. The over all prevalence among male children is 36.6%. Likewise among 38 female children studied, the seroprevalence of Helicobacter pylori in the age group of 2-3 years is 33% out of 9 samples tested. Likewise in the age group of 4-6 years is 57%out of the 7 samples tested. In the age group of 7-12 years it is 64% out of 14 samples and in 13-16 years of age it is 50% out of 8 samples tested. The over all prevalence among female children is 51%. The overall seroprevalence detected among the 88 children of both sexes is 43.39%. it is observed that , female children acquired infection at an early age of 2-3 years while male children became infected only after 3 years. There is a steady increase in the age related sero prevalence among both the sexes and by the age of 12 years about 50 children of both sexes have acquired infection.

Table 2
showing details of age, sex, economic status, family status and Helicobacter pylori seroprevalence among the study group(2-3years)

SI NO	AGE(YEARS)	SEX	FAMILY SIZE		INCOME GROUP	Au/ml	REMARKS
			LARGE	SMALL			
1	2	M		YES	LIG	12	N
2	2	M		YES	MIG	14	N
3	3	M		YES	LIG	12	N
4	3	M		YES	LIG	5	N
5	3	M		YES	LIG	14	N
6	2	M		YES	LIG	14	N
7	3	F		YES	MIG	6	N
8	3	F		YES	MIG	5	N
9	2	F		YES	MIG	2	N
10	3	F	YES		LIG	3	N
11	3	M	YES		LIG	45	P
12	2	F	YES		MIG	71.5	P
13	3	F	YES		LIG	9	N
14	2	F	YES		LIG	12.5	N
15	2	F	YES		LIG	4	N
16	3	F	YES		MIG	5.5	N
17	3	F	YES		LIG	5.3	P

LIG-Lower income group, MIG-middle income group, Au/ml- arbitrary units/millilitre, N- Negative , P-Positive, large family size- more than 4 members in the family, small family size- four or less than 4 members in a family. In this group 1 male child and 2 female child were H.pylori sero positive. 1 female child belong to middle income family with a large family size and the other one belong to large income family and lrge family size. The male child is from lower income group with large family size.

Table 3

showing details of age, sex, economic status, family status and Helicobacter pylori seroprevalence among the study group(4-6years)

SI NO	AGE(YEARS)	SEX	FAMILY SIZE		INCOME GROUP	Au/ml	REMARKS
			LARGE	SMALL			
1	6	M		YES	MIG	4	N
2	6	M		YES	LIG	2	N
3	6	M		YES	LIG	56	P
4	6	M	YES		LIG	47.51	P
5	5	M	YES		LIG	47.51	P
6	4	M	YES		MIG	72.5	P
7	4	M	YES		LIG	17	N
8	6	M		YES	MIG	7	N
9	6	M		YES	MIG	15	N
10	6	M		YES	LIG	2	N
11	6	F	YES		LIG	35	P
12	5	F	YES		LIG	87.5	P
13	4	F		YES	MIG	23	P
14	6	F	YES		MIG	4	N
15	6	F	YES		LIG	2	N
16	4	F		YES	MIG	47.5	P
17	4	F		YES	MIG	3	N

In this group four male children and four female children were H.pylori sero positive. All the sero positive girls belong to lower income group . in this 4 female two belong to lrge family size and two belong to small family size. All the sero positive boys are from lower income group . three boys belong to large family size and one from small family size.

Table 4

showing details of age, sex, economic status, family status and Helicobacter pylori seroprevalence among the study group(7-12years)

SI NO	AGE(YEARS)	SEX	FAMILY SIZE		INCOME GROUP	Au/ml	REMARKS
			LARGE	SMALL			
1	7	M		YES	LIG	75	P
2	8	M	YES		LIG	80	P
3	8	M	YES		LIG	22.5	P
4	7	M		YES	MIG	5	N
5	12	M		YES	LIG	32.5	P
6	12	M		YES	LIG	58	P
7	7	M	YES		MIG	15	N
8	7	M		YES	LIG	220	P
9	9	M		YES	LIG	214	P
10	9	M	YES		MIG	2	N
11	8	M	YES		LIG	27	P
12	12	M	YES		MIG	13.5	N
13	12	M		YES	LIG	52.5	P
14	9	M	YES		MIG	10	N
15	12	M		YES	LIG	27.5	P
16	7	M	YES		LIG	41.5	P
17	8	M	YES		MIG	0.15	N
18	9	M		YES	MIG	7.5	N
19	7	M		YES	MIG	5	N
20	8	M	YES		LIG	35	P
21	11	M	YES		LIG	80	P
22	10	M	YES		MIG	15	N
23	11	M	YES		MIG	3	N
24	10	F		YES	LIG	26.5	P
25	7	F		YES	LIG	27.5	P
26	8	M		YES	MIG	14	N

27	9	F	YES		LIG	27.5	P
28	7	M	YES		MIG	6	N
29	7	F		YES	LIG	27.5	P
30	12	F		YES	LIG	47.5	P
31	8	F	YES		MIG	13	N
32	12	F	YES		MIG	10	N
33	12	F	YES		LIG	40	P
34	12	F	YES		MIG	15	N
35	8	F	YES		MIG	7	N
36	12	F		YES	MIG	3	N
37	7	F		YES	LIG	27.5	P
38	8	F		YES	LIG	50	P
39	11	F		YES	LIG	56.5	P

In this group 13 male children and 9 female children were H. Pylori sero positive . all the sero positive boys belong to LIG out of which 7 were from small family size, 6 of them from large family size. All the sero positive children belong to lower income group , here 7 were from small family size 2 from large family.

Table 5

showing details of age, sex, economic status, family status and Helicobacter pylori seroprevalence among the study group(13-16years)

SI NO	AGE(YEARS)	SEX	FAMILY SIZE		INCOME GROUP	Au/ml	REMARKS
			LARGE	SMALL			
1	13	M		YES	MIG	14	N
2	14	M		YES	LIG	45	P
3	13	M	YES		MIG	9	N
4	15	M	YES		MIG	13	N
5	15	M		YES	LIG	23	P
6	14	M	YES		MIG	8	N
7	16	M		YES	MIG	200	P
8	16	F		YES	MIG	65	N
9	13	F		YES	LIG	40	P
10	13	F		YES	MIG	15	N
11	13	F		YES	LIG	22	P
12	14	F		YES	LIG	32.5	P
13	15	F	YES		MIG	6	N
14	14	F	YES		LIG	300	P
15	14	F	YES		MIG	10	N

In this group 3 boys and 4 girls were H.pylori sero positive . all girls belong to LIG , here 3 are from small family size , one from large family size. Mong 3 boys 2 are from large income group and were from small family size . one boy from middle income group and belong to small family size. Concentration of > 20 Au/ml indicates sero positive status. It was higher among children of 7-12 years age group. However 4 out of 21 male in this age group showed high titers.

DISCUSSION

Helicobacter pylori is capable of not only surviving but also of growing in human stomach, it can produce development of gastric and duodenal ulcer and cancer[4,5]. Elimination of Helicobacter pylori by antibiotic therapy results in the resolution of disease. Helicobacter pylori appears to colonize only in gastric epithelium[6]. Although there is little biochemical or genetic evidence, Helicobacter pylori appears to remain associated with epithelial surface by several adhesions, including those that binds to Lewis antigen (an erythrocyte antigen) with terminal fructose residues, some bind to phosphatidylethanolamine. Much of the evidence of the pathogenic nature of Helicobacter pylori is attributed to the fact that it's presence is always associated with chronic active gastritis. Malathy et al[7,8], reported Helicobacter pylori prevalence of 9% t 2-5 years;31% at 6-9 years; 46% at 10-14 years,

showing an increase in positivity with age. In this study the seroprevalence between 13-16 years of age is 46.66 which is corroborative with the above observation. The overall seroprevalence in the age group 2-16 years in boys is 36.61% where as in girls is 51% . this indicates with increase in age, seroprevalence is almost same among both sexes. Similar finding have been observed in a study conducted by Kate et al. One of the major risk factor for acquiring Helicobacter pylori infection is low socio economic status as observed by Bujanover et al[9]. Individuals belonging to larger families had a high risk of Helicobacter pylori infection as observed by Kate et al. Low socio-economic status and large family size were independent risk factors for Helicobacter pylori infection among children with appreciable exposure opportunity at home[10]. Precarious hygiene, crowded living conditions , improper sanitation play a role in interfamilial transmission of Helicobacter pylori and these are associated features of low socio-economic status families in india[11].In this study also there is high prevalence of Helicobacter pylori infection in low socio-economic groups which is shown by table 2,3 ,4 and 5. Here 38 seropositive children among 88 tested belongs to low socio economic group. A high seroprevalence of Helicobacter pylori among 45% of asymptomatic children by the time of 12 years of age. Acquisition of infection at an early age of 2 years and infection increases with age have been observed in this study.

CONCLUSION

It will be ideal to screen all children of low socio-economic status to detect Helicobacter pylori infection. Effective and curative treatment are available. Early recognition and treatment is likely to be very useful for the good health of children. With the availability of non-invasive test, screening children for the detection of anti-Helicobacter pylori antibodies in a regular fashion will be an ideal measure for early recognition, prompt treatment and also for breaking transmission cycle.

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