

Original Article

Prevalence of Helicobacter Pylori among Sudanese children admitted to a specialized children hospital

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ABSTRACT

The infection by Helicobacter Pylori (HP), a gram-negative bacillus, is more prevalent in the developing countries, and more often among younger people reaching up to 10% of the population in comparison to only 0.5% in more developed world. Generally HP is asymptomatic in children. This study aimed to determining the prevalence of Hp among Sudanese children and to recognize associated epidemiological features. It was a prospective cross sectional study at Gaafar Ibn Aouf children hospital (GCH) in the period between December 2010 and May 2011. GCH is the largest specialized referral hospital in Khartoum and in the Sudan. Those who were diagnosed before as Hp positive were excluded. Full history, Physical examination was performed. A blood sample was taken from every patient and serum was kept at -20°C

to be tested for Hp IgG antibodies through ELISA kit (Monobind; Inc., California, USA) as directed by the Manufacturer, and 20 U/mL for antibodies was considered significant and positive. Using SPSS Version 21, categorical variables were compared with Chi-square test where $P < 0.05$ was taken as statistically significant. This current study included 128/312 (40.1%) children admitted to the hospital who were +ve for HP (56.3% = male). The prevalence of HP is 56.3% among Sudanese children. Prevalence of HP increased with age and was directly related to mother and father level of education, socioeconomic status and positive family history.

Key words:

Helicobacter pylori; Organism; Sudanese; Children; Socio-economic.

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INTRODUCTION

Helicobacter pylori (HP) is a gram-negative bacillus responsible for one of the most common infections found in humans worldwide. Isolated and cultured in early eighties by Warren and Marshall, and after few years they recognized its relationship to gastric and duodenal ulcers at all ages, a discovery that allowed them to be awarded Nobel Prize in 2005 [1]. This gram negative bacillus is more prevalent in developing countries, more often among younger ages reaching up to 10% of the population in comparison to only 0.5% in more developed world [2]. Generally, HP is asymptomatic in children [3]. It has a strong relationship with reflux esophagitis in adult and a lot of debate exists regarding its relationship with recurrent abdominal pain in pediatrics age group [4-6]. Some data support the subsidence of recurrent abdominal pain on treating HP, however other studies reject it [5,6]. Debate regarding HP continues regarding its role in child growth and development, since it was presumed that the organism play a role in reducing appetite in children by reducing the level of ghrelin hormone [7]. Although the prevalence of HP is up to 10% and from 15-46% in developed and developing countries respectively, studies suggest increase in prevalence with age in up to 3% each year [8,9]. *Helicobacter pylori* (HP) usually acquired in children who develop peptic ulcer disease in adulthood but without proven evidence for causing gastrointestinal symptoms in children [10]. Since a lot of controversial issues regarding the age, sex, complications, surrounding the epidemiology of HP, study is needed to help in clarifying this issue and no previous studies done on epidemiological factors in HP in children. The aims of the study were to determine the prevalence of HP among Sudanese children and to recognize epidemiological feature associated with HP in the study group.

METHODS

This prospective cross sectional study was conducted in Gaafar Ibn Aouf children hospital (GCH) in the period between December 2010 and May 2011. GCH is the biggest specialized referral hospital in Khartoum, Sudan, and in the country as a whole. The hospital has large catchment area with patients reporting to it from

all over Khartoum state in particular and the country at large. The hospital used to receive 250-350 patients daily, with average admissions of 20-30 patients from these.

The researcher used to see all the newly daily admitted patients once weekly for the period of the study. The inclusion criteria included admission to hospital and age between one and 15 years. Those who were diagnosed before as HP positive were excluded. Full history was obtained including social demographic factors namely: age, sex, home address, and level of education of parents. Physical examination was performed for all patients and the findings recorded. Patients were also fully investigated and treated for their relevant presenting condition. A blood sample was taken from every patient and serum was kept at -20°C to be tested for HP IgG antibodies through ELISA kit (Monobind; Inc., California, USA) as directed by the Manufacturer, as 20 U/mL for antibodies to be considered significant and positive [11]. A microbiologist did the test. The socioeconomic status of patients was determined using Modified Kuppaswamy's socioeconomic scale [12].

SPSS version 21 was used for data analysis. Categorical variables were compared using Chi-square test. $P < 0.05$ was taken as statistically significant. Ethical approval was obtained from the Research and Ethics Committee of GCH. Informed consent was obtained from parents of all participants.

RESULTS

This study showed 128/312 (40.1%) children presented and admitted to GCH to be positive for HP. The gender distribution was 56.3% and 43.7% as males and females, respectively (Table 1). Prevalence of HP increased with age where it was 13.3% in those who were less than 36 month and 40.6% in those who were more than 109 month (Table 1). The prevalence directly related to mother and father level of education, 43.8% and 44.5% of mothers and fathers have no formal education in contrast to 18% and 16.4% mother and father receive university education. Thirty three percent and 66.4% of the cases had good and poor to moderate socioeconomic status, respectively. While 43.8% of the cases have positive family history of HP, 56.2% were without family history (Table 2).

Table 1 - Distribution of positive cases across age and sex.

Age	Male		Female		Total	
	No	%	No	%	No	%
Less than 36 month	9	7	8	6.3	17	13.3
37-72 month	15	11.7	10	7.8	25	19.5
73-108 month	19	14.8	15	11.7	34	26.6
109-144 month	29	22.7	23	17.9	52	40.6
Total	72	56.3	56	43.7	128	100

Table 2- Epidemiological factors.

Level of education	Mothers	%	Fathers	%	Total
Post graduates	–	–	3	2.3	–
University level	23	18	21	16.4	–
High school	49	38.2	47	36.7	–
No formal education	56	43.8	57	44.5	–
Total	128	100%	128	100%	–
Socio-economic status	–	–	–	–	–
Good	–	–	–	33.6	43
Poor-moderate	–	–	–	66.4	85
Total	–	–	–	100%	128
Positive family history of HP	–	–	–	–	–
Member in the family has positive history	–	–	–	43.8	56
Member in the family has negative history	–	–	–	56.2	72
Total	–	–	–	100	128

DISCUSSION

This current study showed HP predominance in male (56.3%), increased prevalence with age having 13.3% in less than 3 years to 40.6% in those who were 9-12 years, and associated with low level of education as well as low socio-economic status. To our knowledge this is the first study directed to children for prevalence and epidemiological factors in Sudanese children using non-invasive serology. The current study showed prevalence of 41.02, a finding that is consistent with other prevalence in children in other African countries like Uganda (44.3%), Kenyan (45.6%) and Cameroon (37.5%)

[12-14]. This similarity in prevalence in our study in Sudan, and in west Africa and east Africa indicates similarities in the socio-economic status, however still the prevalence is lower than studies done in Australia among African refugees where it counts to 82%. The rate of prevalence in Australia might be due to many factors, out of these is the procedure done for investigation like monoclonal fecal antigen enzyme immunoassay testing (MFAT); the high facilities technique implemented probably the refugees came from high prevalent countries with HP [15]. These findings indicate that pediatric age groups in

developing countries have high rate of harboring HP [15]. In fact, one study done recently in Sudan showed a prevalence of HP up to 58%, using stool antigen detection for HP antibodies, however, this high prevalence was probably due to a small sampling and the type of selected cases, which presented with GIT complaint [16]. The advance in age among pediatric age group, associated with increase in prevalence as it showed in this study. Prevalence in less than three year was 13.3% compared to 40.6% in those above nine years. Our findings were in agreement with some countries like Egypt, West African countries as well as east Africa [14]. 56.3% of the positive cases for HP were male, while 43.7% were female, a finding which is in harmony with Ugandan study using blood serology [14]. Also with a Sudanese study using stool antigen against Hp antibodies among children [16], however not with Australian studies using stool antigen as well as other Sudanese studies using stool antigen for adult patient [17]. Forty four percent of our positive cases have other members in the family like mothers, sisters and brothers involved with HP. This finding is in agreement with many assumptions, however, not with other Sudanese studies involving adult patient with GIT problems [15,18]. A sort of transmission among those who

lived closely together might explain this. Low socio-economic status (income, housing condition, mother's and father's education) associated with increased prevalence of HP. This was in consistency with other studies done in Sudanese children and Egyptian studies in contrast to Ugandan and other studies among children with HP [14,16,19,20].

CONCLUSION

The prevalence of HP among Sudanese children is 56.3%, with a male predominance. This study draws the attention to the high prevalence of HP and the related factors, hence urging early recognition and awareness of its possible complications. The limitation of this study is the absence of invasive investigation and stool antigen against HP antibodies, endoscopy and histopathology. The cost and unavailability of resources were the main reasons behind this limitation.

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