Results

The over all incidence of H pylori infection in the patients encountered in this study was 49.66% compared to 5% in the subjects control.

Table (3) :-

Showed the age distribution of patients. The total number of patients were 36, 18 patients were from 1 month to 5 years old "preschool" and the school age were 18 patients, their ages varied from 5 years up to 15 years "school age", with percentage of 50% for each group.

Table (4):-

Showed the age distribution of control (asymptomatic).

This group included 18 children. There were 11 children in the preschool age (1 month- 5 years) with percentage 61% and 7 children were at the school age >5 years with percentage of 39%.

Table (5):-

Presented the prevalence of H pylori in relation to sex.

From the 36 patients there were 13 females and 6 from them were H pylori positive with percentage of 46.15%. And 23 from 36 patients were males, 11 patients of them were H pylori +ve with percentage of about 47.83% this difference in prevalence of H pylori in relation to sex was found statistically non significant.

Table (6):-

Shows the relation between H pylori and serum gastrin. From 36 patients the H pylori positive cases were 17 with percentage of 47.22% and the mean serum gastrin for this group was about 72.72+ 38.03 ng/L the remaining cases were H pylori -ve with percentage of 52.77% and their mean serum gastrin was 38.03+ 22.68 ng/L. From this table it is obvious that the mean serum gastrin is statistically significantly higher in positive H pylori group compared to that of negative H. pylori group ($P<0.05$)

Table (7):-

Presented the relation between age, H pylori and serum gastrin. From 18 patients in preschool age, 8 were H pylori positive with percentage of 44.44% and the mean serum gastrin level for this group was 56.89+36.8 ng/L.

From 18 patients in the school age >5 years, there were 9 patients H pylori +ve with percentage of 50% and the mean serum gastrin for this group was 73.04+38.6 ng/L.

This difference in prevalence of H pylori infection in preschool and school ages was found statistically to be non significant.

This table also showed that the mean serum gastrin was significantly higher in school age compared to that of preschool age.

Table (8):-

Shows the prevalence of H pylori in relation to different GIT symptoms which are recurrent abdominal pain, recurrent vomiting and hematemsis. H pylori was found to be positive in 20% of patients complaining of recurrent abdominal pain compared to 63.64% in those of recurrent vomiting. This indicates that there is highly significant increase in the prevalence of H pylori infection in cases complaining of recurrent vomiting compared to that complaining of recurrent abdominal. pain.(Chi2 17.8 P≤0.0001). Compared with the prevalence rate in recurrent abdominal pain group(20%) H pylori prevalence rate in cases suffering of haematemsis (53.33%) was found to be statistically significantly higher in cases of haematemesis compared to cases of RAP (Chiz 15.3 P=0003).

Also in comparison between prevalence rate of H pylori infection in cases suffering form recurrent vomiting with percentage 63.64% to those suffering from haematemsis with percentage of 53.33% there was no significantly difference between the prevalence in the two groups (chi2=3.2 P=0.08)

Table (9):-

Presented the prevalence of hypergastrinemia in relation to symptomatic cases (H.P+ve & H.P-ve). From the total No. of patients 36 , 17 were H.P positive and 6 of them had hypergastriemia with percentage of 35.29%, the remaining cases (19) were H.P

negative and (4) from them had hypergastremia with percentage of 21.05% and this prove that there is statistically significant higher prevalence of hypergastriemia in H.P +ve cases compared to the H.P -ve cases. chi2=4.1 ($P<0.05$)

Table (10):-

Comparison between serum gastrin level in H.P positive cases with symptoms and control (asymptomatic). From this table it is evident that:

Patients complaining of RAP were 10 children, 2 of them were H.P +ve, and their mean serum gastrin was 116.16 ± 146.48 ng/L, compared to 71.21± 33.92 ng/L of asymptomatic children. This relationship was found to be statistically significant ($P< 0.05$). Seven H.P +ve patients out of 11 patients were suffering from recurrent vomiting with a mean serum gastrin 64.66 ± 75.24 ng/L, compared to that of asymptomatic (control group) 71.21± 33.9 ng/L and this relationship was found to be statistically not significant.

From 15 patients complaining of hematemsis, 8 patients were H.P +ve and their mean serum gastrin was 68.92 ± 115.8 ng/L compared to 71.21± 33.9 ng/L of asymptomatic children and this was found to be statistically not significant.

Correlation studies revealed significant positive correlation ($r = +0.56$ P value <0.05) between serum gastrin level and age of the studied groups. Meaning that serum gastrin level increases with the increase of age.

Table (11):-

Shows the endoscopic findings in relation to GIT symptoms and this table reveals that:

For the group who was suffering from repeated abdominal pain, the most common endoscopic finding was esophagitis, the next lower incedance was gastritis and hiatal hernia at same rate. Incompetant cardia was in lower rate than the last two presentations. Lastly there was one patient who suffered from RAP and was endoscopicaly free.

The most common endoscopic finding in cases presented by repeated vomiting was esophagitis followed by, from high to low incidence, incompetent cardia, hiatal hernia, and gastroesophagial reflux.

No one of the cases who was suffering from repeated vomiting had gastritis, at the same time no one had normal endoscopic finding. The order of incidence of the endoscopic finding in cases presented by haematmesis were esophagitis(most common), gastritis, varicose veins, small ulcers, and one case with normal endoscopic finding, which presented with past history of haematmesis.

common), followed by incompetent cardia with lesser incidence, lastly gastritis and GER with the same least incidence. There was one case with normal endoscopic findings had hypergastrinemia.

Table (15):-

Comparison between serum gastrin level in H.P positive cases (with symptoms). and it is shown as follow:

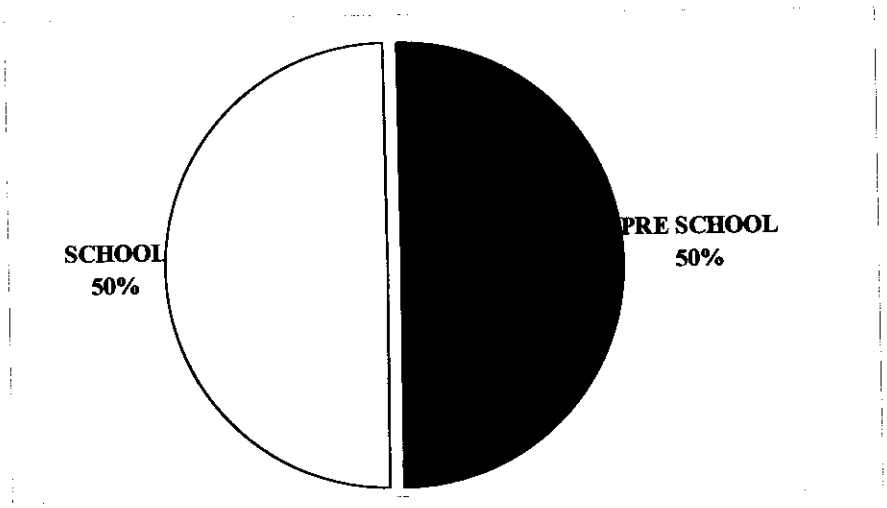
Patients complaining of RAP were 10 children, 2 of them were H.P positive and their mean serum gastrin was 116.16±196.84ng/L compared to 71.21 ± 33.92ng/L of asymptomatic children. This relationship was found to be statistically significant ($P<0.05$) Positive H.P patients of 11 cases suffering from recurrent vomiting had a mean serum gastrin.64.66 ± 75.24ng/L compared to that of asymptomatic (control) group which is 71.21 ± 33.9ng/L and this relationship was found to be statistically not significant.

(T= 1.1& P=0.19). From 15 patients complaining of Haematemsis 8 were H.P +ve and their mean serum gastrin was 68.92 ± 115.8 ng/L compared to 71.21 ±33.9 ng/L of asymptomatic children, and this was found to be statistically not significant.(T=0.92 &P=0.21)

Table (3)

Age distribution of patients

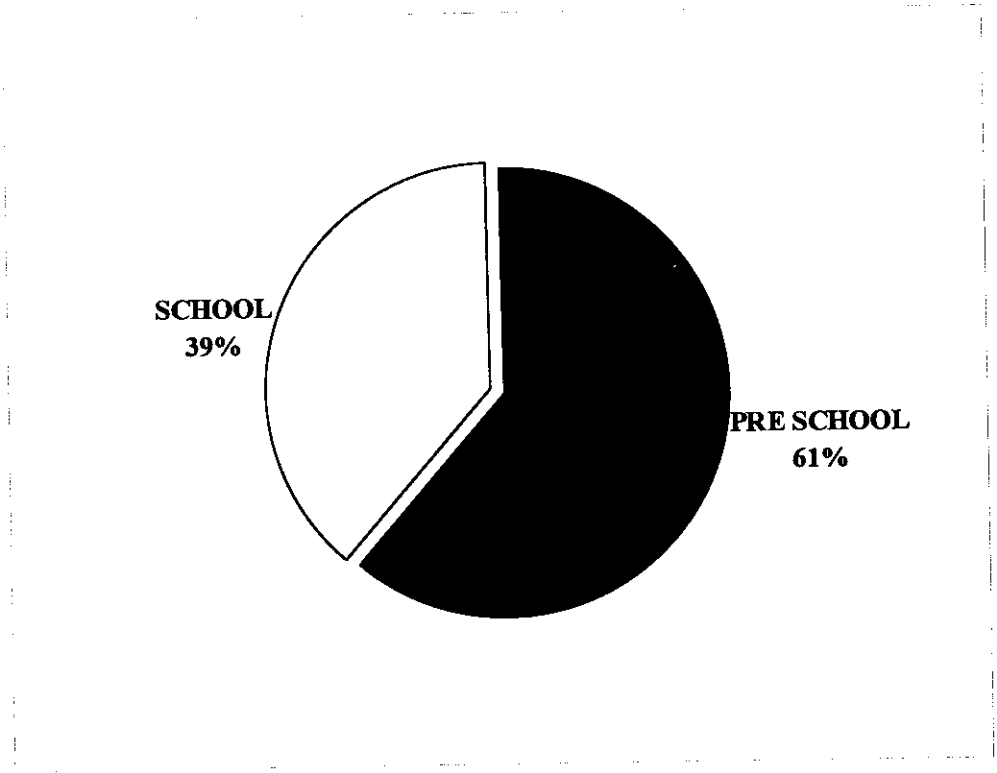
AGE	NUMBER	%	mean $\pm$ S.D
PRE SCHOOL 1 m -5 ys.	18	50	1.9 ± 1.3
SCHOOL > 5 ys	18	50	9.64 ± 2.24



Table(4)

Age distribution of control (asymptomatic)

AGE	NUMBER	%	mean $\pm$ S.D
PRE SCHOOL 1 m -5 ys.	11	61.11	2 $\pm$ 1.6
SCHOOL > 5 ys	7	38.89	9.3 $\pm$ 1.9

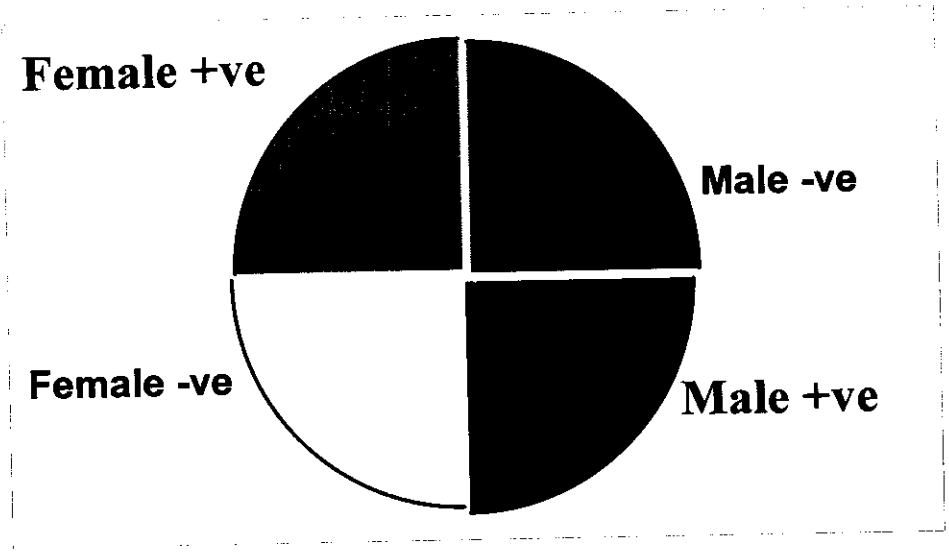


Table(5)

Prevalence of *H. pylori* in relation to sex.

SEX	Total no.	+ve *H. pylori*	%
Female	13	6	46.15
Male	23	11	47.83

Chi test between % +ve *H. pylori* = 0.59 P= 0.62

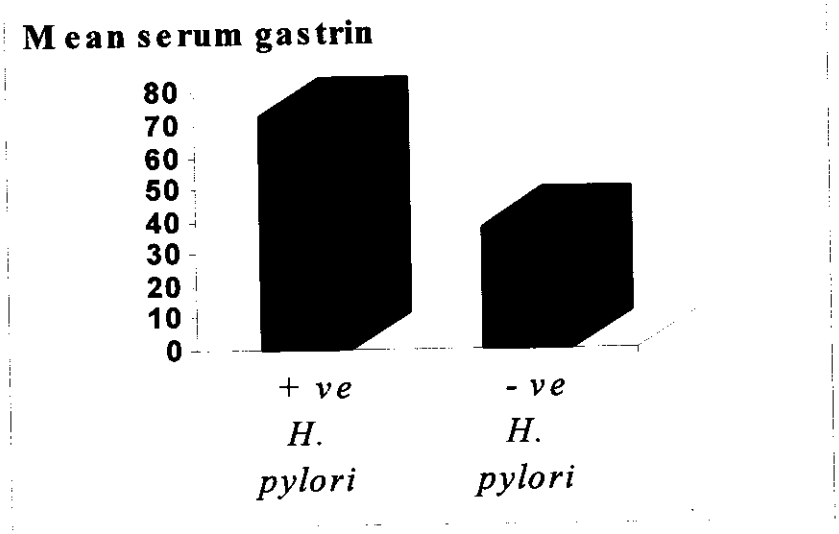


Table(6)

Relation between H. pylori and serum gastrin in symptomatic cases (n=36)

	patients (n=36)		Serum gastrin (n= 36)	
	No.	%	Mean	± S.D.
+ve H.P patients	17	47.222	72.72	38.03
-ve (H.P) patients	19	52.778	38.03	22.68

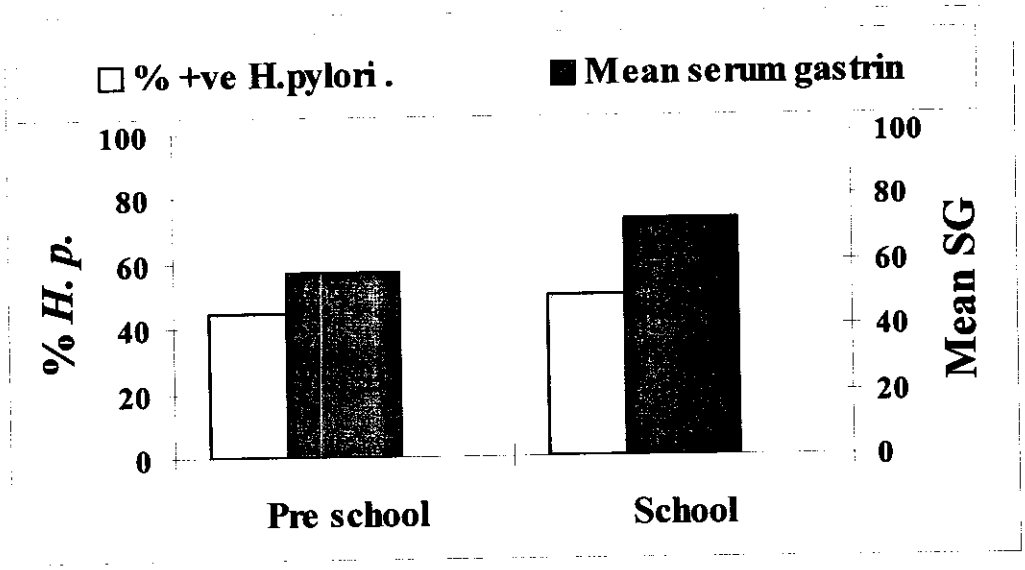
T test between mean serum gastrin = 3.32 p = 0.009
(H.P.) Helicobacter pylori



Table(7)
Relation between age and Serum gastrin in H. pylori +ve case

AGE	*H.pylori* (n=17)		Serum Gastrin (ng)	
	+ ve	%	mean	± S.D.
PRE SCHOOL 1 m -5 ys. n = 18	8	* 44.44	** 56.89	36.80
SCHOOL >5 ys. n = 18	9	50.00	73.04	38.66

* Chi test between % +ve H. pylori = 0.5 P = 0.631 Not sign.
* T test between mean serum gastrin = 2.63 P = 0.04 Sign.



Table(8)

Prevalence of H. pylori in relation to different GIT symptoms

Symptoms	Total no. (n = 36)	+ve H. pylori	%
RAP *	10	2	20.00
Vomiting	11	7	63.64
Haematemesis	15	8	53.33

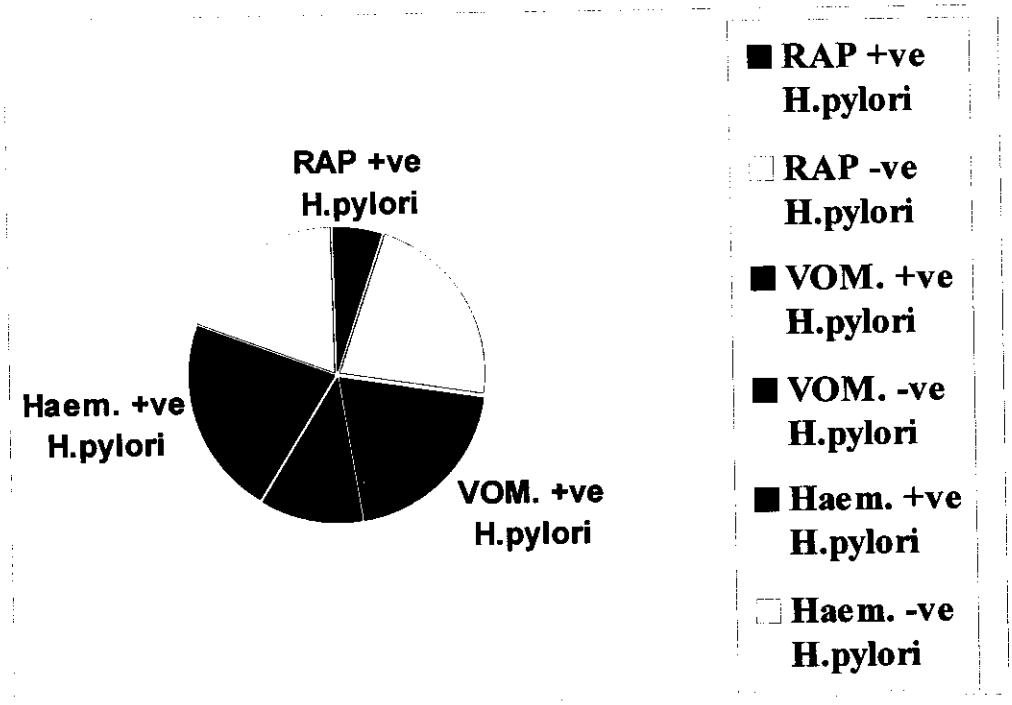
* RAP = Recurrent abdominal pain

GIT= Gastrointestinal tract

RAP & Vomiting $CHI^2 = 17.8$ $p = 0.0001$ Highly sign. difference.

RAP & Haemat. $CHI^2 = 15.3$ $p = 0.0003$ Highly sign. difference.

Vom. & Haemat. $CHI^2 = 3.2$ $p = 0.08$ Not sign.

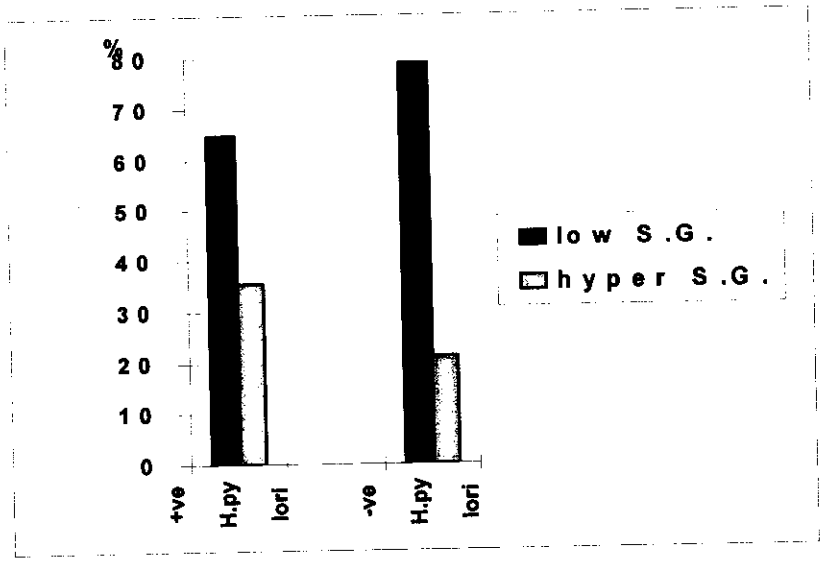


Table(9)

Relation between symptomatic cases (H.P. +ve or-ve) and hypergastrinemia.

H.pyloi	Normal SG 0-90		Hyper SG >90	
	no.	%	no.	%
Patients (n=36)				
+ve (n=17)	11	64.71	6	35.29*
-ve (n=19)	15	78.95	4	21.05

* Chi2 = 4.1
P = 0.035



Table(11)

Endoscopic finding in relation to GIT symptoms

Endoscopic finding	RAP 10	Vom. 11	Haem. 15
Normal	1 (10 %)	-	1 (6.7%)
Incompetant cardia	2 (20 %)	4 (36.4%)	--
Gastritis	3 (30 %)	-	4 (26.7)
Esophagitis	4 (40 %)	11 (100%)	9 (60%)
Hiatal hernia	3 (30 %)	3 (27.3%)	1 (6.7)
GER	--	1 (9.1%)	--
Varicose veins	--	1 (9.1%)	2 (13.3%)
Gastric ulcers	--	--	1 (6.7%)

GER = gastroesophagial reflux

Table(12)

Endoscopic finding in relation to age

Endoscopic findings	Preschool 18	School 18
Normal	1 (5.6 %)	1 (5.6%)
Incompetant cardia	5 (27.8 %)	1 (5.6%)
Gastritis	1 (5.6 %)	6 (33.3 %)
Esophagitis	16 (88.9%)	8 (44.4%)
Hiatal hernia	3 (16.7%)	4 (22.2%)
GER	1 (5.6%)	--
Varicose veins	-	2 (11.1%)
Gastric ulcers	-	1 (5.6%)

GER = gastroesophagial reflux

Table(13)

Endoscopic finding in relation to seroprevalence of H. pylori

Endoscopic finding	+ve H. pylori 17	-ve H.pylori 19
Normal	-	2 (10.6%)
Incompetant cardia	3 (17.6%)	3 (15.8%)
Gastritis	5 (29.4%)	2 (10.5%)
Esophagitis	12 (70.6%)	12 (63.2%)
Hiatal hernia	1 (5.9%)	6 (31.6%)
GER	1 (5.9%)	-
Varicose veins	-	2 (10.6%)
Gastric ulcers	-	1 (5.3%)

GER = gastroesophagial reflux

Table(14)

Endoscopic findings in relation to serum gastrin

Endoscopic findings	Normal S.G.(0-90) n=26	Hyper S.G. (>90) n=10
normal	1 (3.8%)	1 (10%)
incompetent cardia	4 (15.4%)	2 (20%)
gastritis	6 (23.1%)	1 (10%)
esophagitis	16 (61.5%)	8 (80%)
hiatal hernia	7 (26.9%)	-
GER	-	1 (10%)
varicose veins	1 (3.8%)	-
gastric ulcers	1 (3.8%)	-

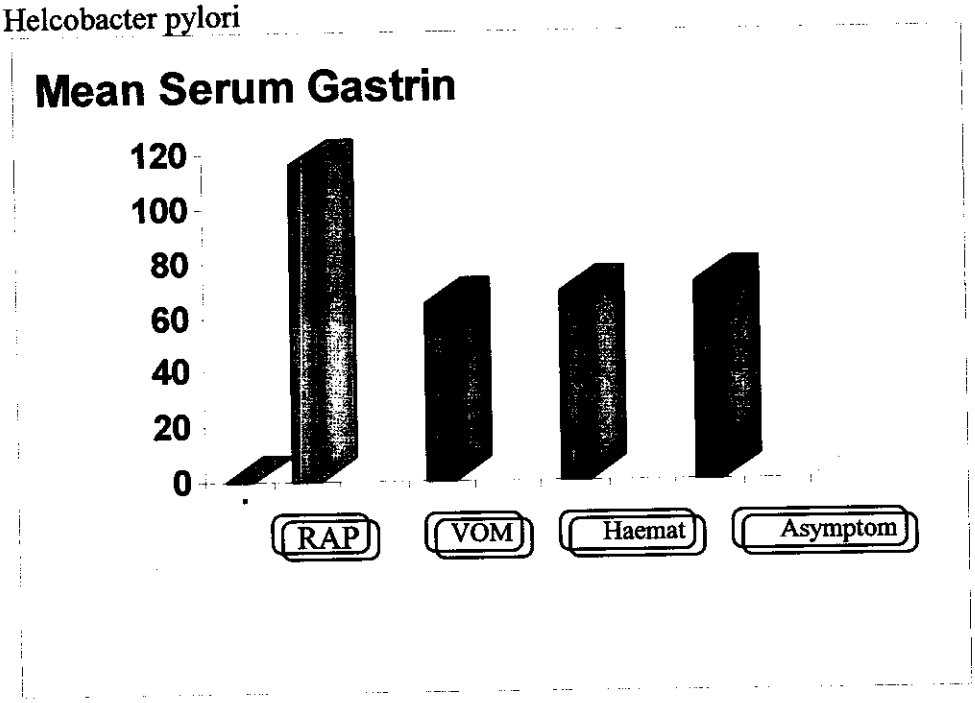
GER = gastroesophagial reflux

Table(15)

Comparison between serum gastrin level in H.P. positive cases with GIT symptoms and control (asymptomatic).

Symptoms	Total number	Serum gastrin Mean	± S.D.	T test T =	P =
RAP	10	116.16	146.84	3.68	0.01 Sign.
VOM.	11	64.66	75.24	1.1	0.19 Not Sign.
Haemat.	15	68.92	115.82	0.92	0.21 Not sign
Asymptomatic	18	71.21	33.92	-	-

GIT= Gastrointestinal tract
HP = Helcobacter pylori



Table(16)

Correlation between H.P. and Age

	Number of patients	Age	
		Mean	± S.D
+ ve H.P. Patients	17	5.9	4.5
- ve H.P. Patients	19	5.6	4.2

T test between mean age = 0.32, P = 0.83

Not significant

Table(17)

Age, Sex, % + ve H.P and serum gastrin in the different Git symptoms

Group	Age	Sex		+ ve H.P	Serum gastrin
PAR n = 10	7.3 ± 3.1	2 8	F M	2 (20%)	47.77 ± 27.34
Vom. n = 11	1.18 ± 0.9	5 6	F M	7 (63.6%)	51.1 ± 26.87
Haem. n = 15	8.1 ± 4.0	6 9	F M	8 (53.3%)	61.27 ± 38.87
Control n = 18	4.85 ± 4.0	7 11	F M	1 (5.6%)	71.21 ± 33.92

Discussion

The over all incidence of H pylori infection in the patients encountered in this study was 49.66% compared to 5% in the asymptomatic group(control).

Helicobacter pylori infection, once acquired , is believed to persist throughout life. Various authors have proposed that the age-specific prevalence of H. Pylori reflects the average age at which the infection is acquired (Fiedorek et al., 1991& Graham, 1990& Mitchell et al., 1991 & Klein et al.,1991). The prevalence of H. Pylori infection in children in developing countries is higher and begins at a younger age than in children in developed countries (Fiedork et al., 1991& Holcombe et al., 1993).

This study was conducted on 36 patients, 23 males and 13 females , the patients in this study were classified according to age to preschool age "1 month to 5 years old" with a mean age 1.9 ± 1.3 years and school age from 5 years old to 15 years old with a mean age 9.64 ± 2.24 years.

All of the patients presented with gastrointestinal symptoms in the form of repeated abdominal pain (RAP), recurrent vomiting or heamatemsis as a main presentation. Eighteen age and sex matched control subjects were also studied and they had no gastrointestinal presentation. They were 7 females and 11 males. 11 children of the control subjects were in the preschool age with a mean age 2 ±1.6 and 7 children in the school age with a mean age 9.3 ± 1.9.years.

The prevalence of H pylori colonization was detected using pyloriset dry which is a latex agglutination test for the rapid detection of H. pylori antibodies in serum. The measurement of fasting serum gastrin was done by double antibody gastrin which is an ^{125}I radioimmunoassay designed for the quantitative measurement of gastrin in serum.

This study showed that there is no significant difference in H. Pylori prevalence rate between preschool and school age. This observation is supported by other data from other African countries such as Nigeria, where no significant increase in the prevalence of infection occurs with age, probably because most subjects are infected before the age of 5 years Holcombe et al., 1992).

The early acquistion of H. pylori infection may be explained by crowded living condition, and by a more intimate contact between children, as well as by the higher prevalence of infection amount adults with a consequent increased risk of child contamination especially with some habits of the Egyptian mothers to give the child chewed food, and taste the nurseries before the infants.

This study revealed that H pylori has no significant difference in relation to sex. This observation is in agreement with other studies which revealed no significant sex difference in adult patient without portal hypertension regarding the prevalence H pylori (Al Moagel et al., Latif et al.,1991 and Zaki, 1992).

Another identical results from an Egyptian study which revealed that no sex difference was noted in relation to H pylori infection (Badr-El-Din et al., 1994).

The results of this study demonstrated significant increase in the serum gastrin in H. pylori seropositive patients compared to that of H. pylori seronegative patients 72.72±38 ng/L versus 38±22 ng/L. for H. pylori seropositive and seronegative patients respectively. This results is supported by other Egyptian results made by Abd El-Aziz and El Midany,1994, who found significant increase in basal gastrin level in infected patients in comparison with non infected patients with mean serum gastrin(46.5 ± 8.13 versus 25.3 ± 4.43) for both infected and uninfected groups respectctively.

Mc Callion et al., found that H pylori seropositive children have a significantly higher circulating fasting gastrin value than seronegative children which is in agreement with the results in the present study. On the other hand Oedera et al., 1990, failed to show a correlation between serum gastrin concentrations and H. pylori status. It was reported that children with peptic ulcer disease did not have high fasting serum gastrin levels when compared with age matched controls (Tsai and Chang, 1992).

According to the analysis of our data, there was significant increase in the mean serum gastrin in seropositive cases of school age children in comparison to that of children in the preschool age

being 73.04 ± 38.6 ng/L versus 56.89 ± 36.8 ng/L for both groups respectively ($P<0.05$).

Katelaris et al., 1993 found that the mean basal serum gastrin concentrations in adults were significantly higher in old subjects than in young subjects (48.8 ± 4.4 versus 36.8 ± 2.3 ng/L.) respectively, $P< 0.05$. They suggested that serum gastrin concentration may rise with age probably because of the increased prevalence of gastric atrophy with consequent loss of acid mediated inhibition of gastrin release. Basal serum gastrin, however was also high in H pylori infected subjects without atrophy supporting the concept of an independent stimulatory effect of the organisms of gastrin release.

Another study made by Mc Callion, 1995, on children who found that in adults with chronic H pylori gastritis, the circulating fasting gastrin is increased by 70% by comparison, the fasting plasma gastrin in children aged 4 to 5 years was increased by 167%, reducing with age to a 75% increase in the 10 to 11 years age group. While chronic H pylori gastritis is associated with normal or raised gastric acid secretion, acute H pylori infection results in transient achlorhydria, which in turn is a stimulus to gastrin production. It is possible, therefore, that the considerable raised fasting gastrin value seen in young children with H. pylori, gastritis is a reflection of achlorhydria associated with a acute infection.

Mossi et al., 1993, reported that plasma level of gastrin is not affected by age or sex.

The most common prevalence rate of H pylori infection was in patient presented with recurrent vomiting 63.64 % followed by cases presented with haematemesis 53.3 % and then cases presented with RAP 20%, patients with history of haematemsis or recurrent vomiting were found to have significant higher incidence of H pylori infection than those with recurrent abdominal pain.[8/15(53.3%)& 7/11(63.64%) versus 2/10 (20%)] respectively .For cases suffering or giving history of hematemesis , recurrent vomiting and RAP respectively. However with a comparison, the prevalence of H. pylori in cases with haematemsis or recurrent vomiting, there is no significant difference in prevalence of H. pylori in both groups.

An Egyptian study made by El Qadhi and Murad, 1993, revealed that H. pylori was more prevalent in adult patients with recurrent abdominal pain and/or diarrhea than those without pain or diarrhea.

Comparing serum gastrin levels in H. pylori seropositive cases with symptoms and that of asymptomatics (seronegative) was done and showed that only cases of repeated abdominal pain had a significantly high levels of hypergastrinemia compared to asymptomatic subjects (116.16 ± 146.84 versus 71.21 ± 33.92 ng/L) for both groups respectively ($P<0.05$)

According to this results there is an association between hypergastrinemia, seropositive H pylori cases and RAP.

Mc Callion et al., 1995 reported that the mean fasting gastrin in seronegative children was 52 ng/L compared with 117 ng/L in

seropositive children(P<0.001). The mean fasting gastrin in seropositive children(117 ng/L) with RAP was not significantly different from that of seropositive children without RAP (115 ng/L.) No association between childhood H pylori gastritis, hypergastrinemia, and RAP was found.

Other supported study reported by Snyder, Co workers 1994 who reported that H pylori may be a cause of RAP in one quarter to one third of the children with RAP in whom other etiologies of RAP are excluded.

All the patients in this study underwent oesophago-gastrodudenoscopy,. The most frequent endoscopic findings were Oesophagitis 66.6%, followed by gastritis 19.4%, Hiatal hernia 19.4%, Incompetent cardia 16.6%, Varicose veins 0.05%, Normal findings 0.05%, GER 0.02%, and Gastric ulcers 0.02%.

With comparison between H pylori seropositive & seronegative cases. H pylori positive cases had significantly higher incidence of endoscopic gastritis than H pylori -ve cases.

H pylori +ve cases had the same incidence of esophagitis as H pylori -ve cases. No association between hypergastinemia and any of the endoscopic findings was found. Gastritis was more prevalent in school age children than preschool age children.(33.3% vs 5.6%) for both groups respectively. No cases of gastric ulcer was found in preschool age children, but one case was found in school age children.

Summary and Recommendations

The aim of this study is to review pediatric patients who are evaluated by upper endoscopy to determine the role of H pylori infection in children with some gastrointestinal presentations and to correlate the presence of infection with age and with serum gastrin concentrations.

This study was conducted on 36 patients 23 males and 13 females with a mean age of 5.77±17 years. All of them presented with gastrointestinal symptoms in the form of repeated abdominal pain (RAP), recurrent vomiting or haematemsis as main presentations. Eighteen age and sex matched control subjects were also studied and they had no gastrointestinal presentation. They were 11 males and 7 females with a mean age of 65± 1.72 years. Out of 36 patients 18 were in the preschool age with a mean age 1.9±1.3 years and 18 were in the school age with a mean age of 9.64±2.24 years. 11 children of the control subjects were in the school age with a mean age of 9.3± 1.9 years.

All the patients and control subjects were subjected to:

1- Full history and clinical examination.

2- Every patient (patients only) was subjected to upper gastrointestinal endoscopy and the endoscopic findings were correlated to the presence or absence of H pylori infection, age , and to serum gastrin level.

3 Diagnosis of exposure to Helicobacter pylori infection was done through detection of serum immunoglobulin against H pylori by Orion Diagnostica's pyloriset Dry which is a latex agglutination test for the rapid detection of H pylori in serum.

4 Also measurment of fasting serum gastrin level for all cases and control subjects was done by Double Antibody Gastrin which is an ^{125}I radioimmunoassay (RIA).

H pylori colonization was significantly higher in patients compared to asymptomatic control being 47% versus5% for both of them respectively.

There was no significant difference in H pylori infection in relation to sex, out of 13 females 6 were H pylori seropositive with a percentage of 46.15 compared to 11 H pylori seropositive males out of 23 males with a percentage of 47.83%.

This study showed that, there is no significant difference in H pylori prevalence rate occurs with age, probably because most subjects are infected at early age of childhood.

The present study confirmed that H pylori affects circulating gastrin concentration. The mean serum gastrin was significantly higher in H pylori seropositive cases than that of H pylori seronegative cases (72.72±38.03 ng/L versus 38.03±22.68 ng/L) for both groups respectively.

The mean serum gastrin was significantly higher in seropositive cases of children in school age group than that of seropositive cases of children in preschool age being 73.04±38.66

ng/L versus 56.89±36.80ng/L for both school age and preschool age children respectively.

H pylori seropositive cases had a significant higher incidence of hypergastrinemia compared with H pylori seonegative cases (35.29 versus 21.05 for both H pylori seropositive and H pylori seronegative cases respectively.

Recurrent abdominal pain was the only gastrointestinal presentation among the other GIT presentation to have significant high incidence of hypergastrinemia compared with asymptomatic subjects 116.16±146.84 ng/L versus 71.21±33.92 ng/L for both groups respectively.

Whether H pylori infection causes hypergastrinemia and the latter causes recurrent abdominal pain or RAP induces hypergastrinemia in H pylori seropositive cases this needs more study.

All the patients underwent oesophagogastrodudenoscopy and the most frequent endoscopic findings in our patients was the oesophgitis 66.6% followed by gastritis 19.4%, hiatal hernia 19.4%, incompetent cardia 16.6%, varicose veins 0.05% and lastly GER & gastric ulcers 0.02% for each.

Cases presented with recurrent vomiting and/ or haematemsis had a higher incidence of H pylori infection than that presented with RAP. Being 63.64% and 53.33% versus 20% for recurrent vomiting, haematemesis and RAP respectively.