

# **RESULTS**

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The study included 48 subjects, 2 biopsies were taken by upper gastrointestinal endoscopic from all of them. Master sheet (Appendix) shows data obtained by history taking and detailed endoscopic findings from all subjects.

## **Patient groups:**

This study comprised 48 Egyptian patients divided according to the endoscopic picture into 4 groups (Table 3).

- 1- Duodenal ulcer group.
- 2- Gastric ulcer group.
- 3- Non-ulcer dyspepsia group.
- 4- Control group.

## **Results of the direct film: (Figures 8 & 9)**

### **[A] Group A:**

The direct smear was positive in 16 patients (Gram -ve curved bacilli) (94.1%) and only one patient was negative (5.9%) (Tables 4 & 8).

### **[B] Group B:**

The direct smear was positive in 6 patients (60%) and 4 patients were negative (40%) (Tables 5 & 8).

### **[C] Group C:**

The direct smear was positive in 9 patients (75%) and 3 patients were negative (25%) (Tables 6 & 8).

**[D] Group D:**

The direct smear was positive in 2 patients (22.2%) and 7 patients were negative (77.8%) (Tables 7 & 8).

The results showed that 75% of the non-ulcer dyspepsia group with or without endoscopic findings were positive for *Helicobacter pylori* (Table 9).

Group (A) showed higher percentage of positive direct smear results when compared to group (B). Statistical analysis of the results showed that this difference is of significant value as  $P < 0.05$ . Comparing group (A) with group (C), group (A) showed higher percentage of positive direct smear but with no significant value as  $P > 0.05$  (Table 10).

**Results of direct urease test: (Figure 10 & Table 8)**

**[A] Group A:**

Sixteen patients showed positive urease test (94.1%) and only one patient showed negative urease test (5.9%).

**[B] Group B:**

Six patients showed positive urease test (60%) and 4 patients showed negative urease test (40%).

**[C] Group C:**

Nine patients showed positive urease test (75%) and 3 patients showed negative urease test (25%).

**[D] Group D:**

Two patients showed positive urease test (22.2%) and 7 patients showed negative urease test (77.8%).

Table (11) showed that 58.9% of the duodenal ulcer cases, 30% of gastric ulcer group, 41.7% of the non-ulcer dyspepsia group and 11.1% of the control group gave positive urease test within 2 hours. It was noticed that the cases giving positive results within 2 hours (change color from yellow to dark pink) were highly positive with direct film in comparison with 12 hours positive urease test and positive direct film case.

Positive direct urease tests were found to give positive results in the direct film examination.

**Results of the culture: (Figures 11-14)**

**[A] Group A:**

Cultures were negative for *Helicobacter pylori* in 9 patients (58.8%) and positive in 8 patients (41.2%) (Table 4).

**[B] Group B:**

Cultures were negative for *Helicobacter pylori* in 5 patients (50%) and positive in 5 patients (50%) (Table 5).

**[C] Group C:**

Cultures were negative for *Helicobacter pylori* in 6 patients (50%) and positive in 6 patients (50%) (Table 6).

**[D] Group D:**

Cultures were negative for *Helicobacter pylori* in all cases (0%) (Table 7).

The results showed that 50% of the non-ulcer dyspepsia group with or without endoscopic findings were positive were positive for *Helicobacter pylori* (Table 9).

Positive cultures were found to be specific but not sensitive compared to the direct smear as the specificity was 100% and the sensitivity was 57.6%. Statistical analysis comparing the results of direct film and culture for all dyspeptic groups (Groups A, B and C), found a significant value as  $P < 0.05$  (Table 12).

Confirmatory tests were done for the cultured *H. pylori* organisms:

- \* Urease (Figure 15), oxidase, catalase tests were positive.
- \* Hippurate test was negative.
- \* Motility test by hanging drop method was positive.

### **The epidemiological results:**

Regarding residence, it was found that 29 patients were living in small villages and 19 patients were living in cities (Banha, Tokh, ...). The results were positive in 25 patients (89.6%) and 8 patients (42.2%) respectively (Table 13 and Figure 16).

Table (14) and Figure (17) showed the increase in the incidence of *Helicobacter pylori* according to age:

- Group I (17-30 years): 10 from 16 cases were +ve (60.5%).
- Group II (31-40 years): 9 from 13 cases were +ve (68.8%).
- Group III (51-60 years): 3 from 4 cases were +ve (75%).
- Group IV (61-70 years): 4 from 5 cases were +ve (80%).

As shown in table (15) and figure (18), 55% of female cases were positive (11 positive out of 20), while 78.5% of male cases were positive (22 positive out of 28).

#### **Results of antibiotic sensitivity tests: (Table 16)**

The radius of the inhibitory zone was observed and it was found that:

- All the strains were resistant to Nalidixic acid, Vancomycin and Trimethoprim.
- Fourteen strains showed resistance to Colistin.
- All the strains were highly susceptible to:
  - \* Ampicillin.
  - \* Cephalothin.
  - \* Ceftizoxime.
  - \* Gentamicin.
  - \* Clindamycin
  - \* Norfloxacin.
  - \* Sulphafurazol.
  - \* Amikacin.
  - \* Chloramphenicol.
  - \* Erythromycin
  - \* Kanamycin.
  - \* Nitrofurantoin.
  - \* Penicillin.
  - \* Tetracycline.



Figure (8): Gram stain direct film of the biopsy showing Gram negative curved bacilli.



Figure (9): silver stain direct film of the biopsy showing brownish curved bacilli.

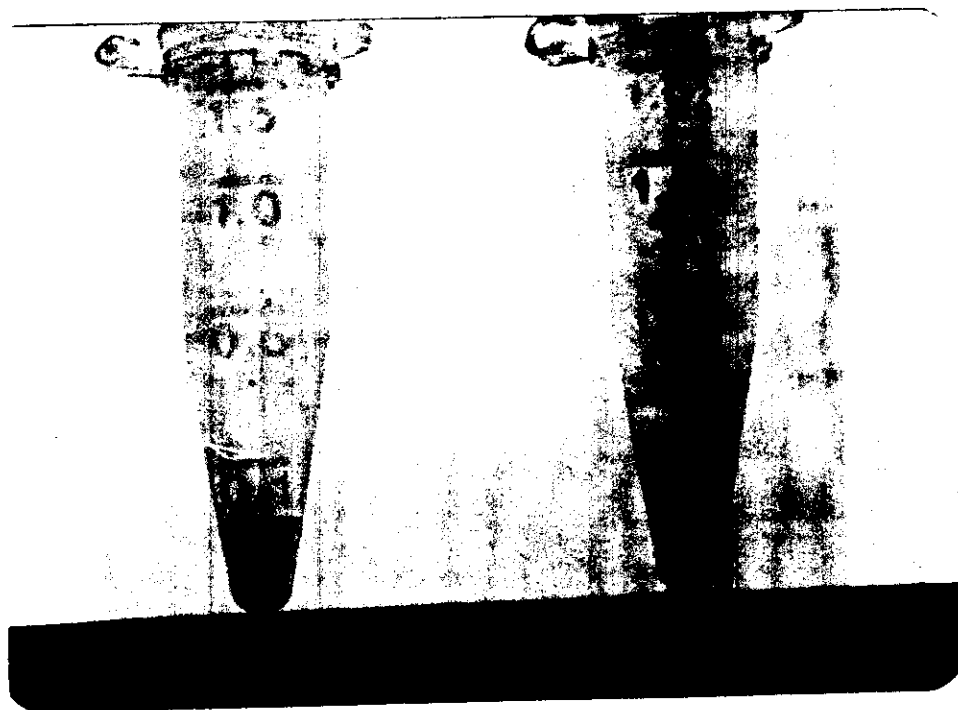


Figure (10): Direct urease test:  
 \* The yellow colour tube represents negative test.  
 \* The dark pink colour tube represents positive test.

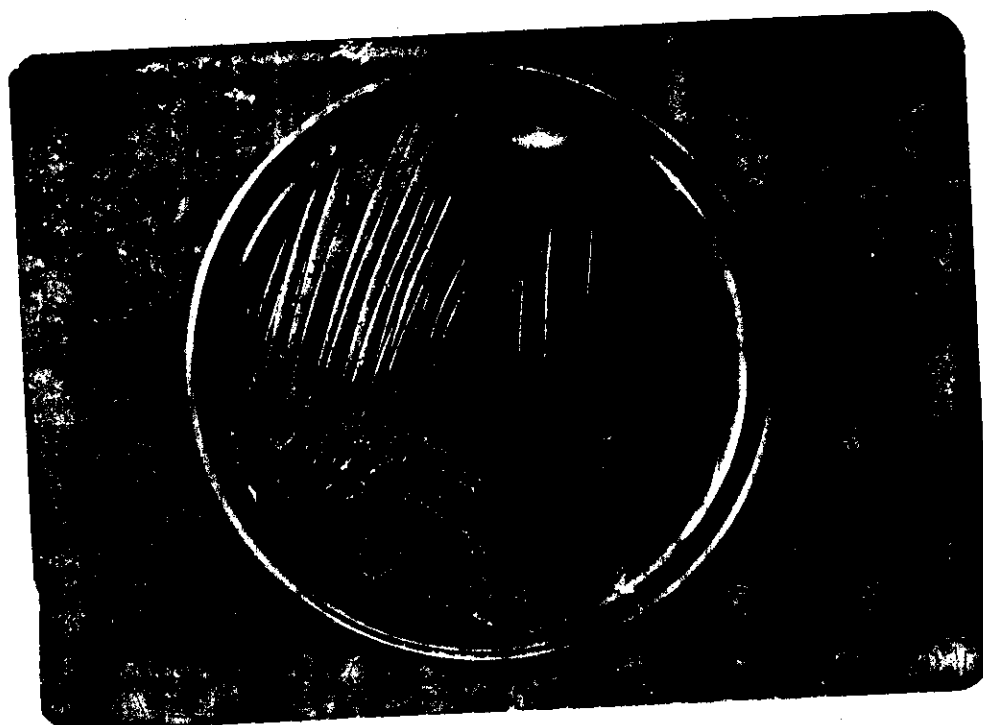


Figure (11): Colonies of *H. pylori* organisms on Skirrow media after culture of the biopsy.





Figure (12): Colonies of *H. pylori* organisms on blood agar media after culture of the biopsy.



Figure (13): Colonies of *H. pylori* organisms on chocolate agar media after culture of the biopsy.



Figure (14): Gram stain of *H. pylori* organisms in culture, showing gram negative bacilli.

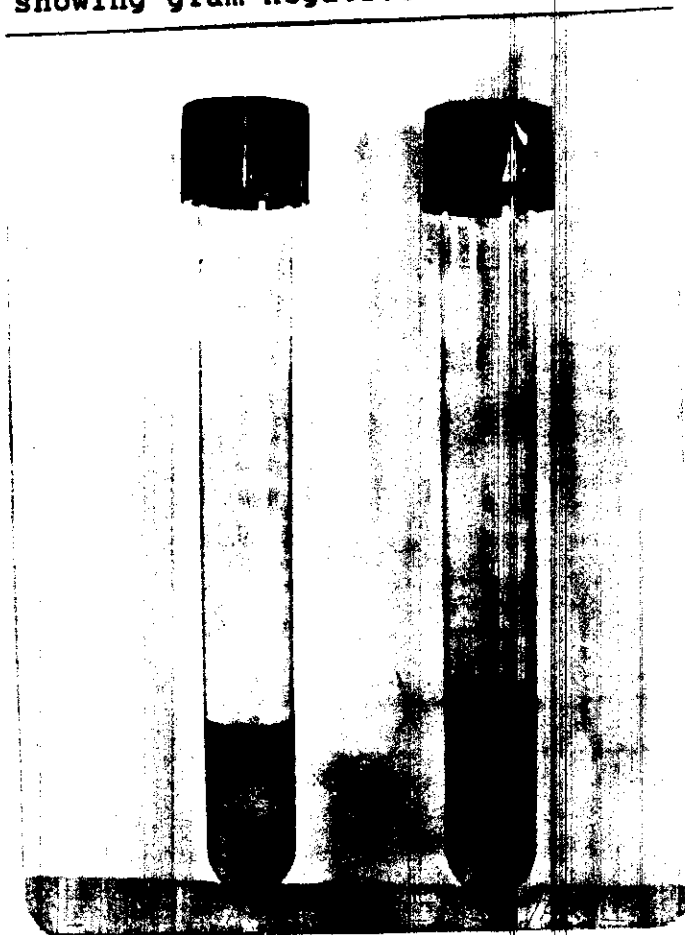


Figure (15): Urease test: (Confirmatory test for isolated organisms)  
 \* The yellow colour tube represents negative test.  
 \* The dark pink colour tube represents positive test.

**Table (3): Data of different groups.**

Group	Total No.	♂	♀	Age (Years)	Mean age $\pm$ S.D.
Duodenal ulcer	17	13	4	23-69	41.41 $\pm$ 14.77
Gastric ulcer	10	9	1	21-70	43.7 $\pm$ 14.57
Non ulcer dyspepsia	12	5	7	17-62	32.83 $\pm$ 12.01
Control	9	1	8	20-56	33.00 $\pm$ 12.69

**Table (4): Bacteriological results for the duodenal ulcer group (Group A).**

Case No.	Direct smear	Direct Urease test	Culture	Confirmatory tests				
				Ur	Ox	Ct	HUH	MT
1	+	+	-					
3	+	+	-					
6	+	+	-					
7	+	+	-					
11	-	-	-					
15	+	+	-					
16	+	+	-					
18	+	+	+	+	+	+	-	+
20	+	+	-					
23	+	+	+	+	+	+	-	+
27	+	+	+	+	+	+	-	+
29	+	+	+	+	+	+	-	+
39	+	+	+	+	+	+	-	+
41	+	+	+	+	+	+	-	+
42	+	+	+	+	+	+	-	+
43	+	+	+	+	+	+	-	+
45	+	+	-					

Ur: Urease test, Ox: Oxidase test, Ct: Catalase test.

HUH: Hippurate hydrolysis test; Mt: Motility test.

**Table (5): Bacteriological results for  
the gastric ulcer group (Group B).**

Case No.	Direct smear	Direct Urease test	Culture	Confirmatory tests				
				Ur	Ox	Ct	HUH	MT
5	+	+	+	+	+	+	-	+
8	+	+	+	+	+	+	-	+
12	-	-	-					
17	+	+	-					
19	-	-	-					
28	-	-	-					
31	+	+	+	+	+	+	-	+
35	+	+	+	+	+	+	-	+
36	+	+	+	+	+	+	-	+
37	-	-	-					

Ur: Urease test, Ox: Oxidase test, Ct: Catalase test.

HUH: Hippurate hydrolysis test; Mt: Motility test.

**Table (6): Bacteriological results for the non-ulcer dyspepsia group (Group C).**

Case No.	Direct smear	Direct Urease test	Culture	Confirmatory tests				
				Ur	Ox	Ct	HUH	MT
2	-	-	-					
4	-	-	-					
10	-	-	-					
14	+	+	-					
22	+	+	+	+	+	+	-	+
26	+	+	+	+	+	+	-	+
30	+	+	+	+	+	+	-	+
32	+	+	+	+	+	+	-	+
33	+	+	-					
40	+	+	-					
44	+	+	+	+	+	+	-	+
46	+	+	+	+	+	+	-	+

Ur: Urease test, Ox: Oxidase test, Ct: Catalase test.

HUH: Hippurate hydrolysis test; Mt: Motility test.

**Table (7): Bacteriological results for  
the control group (Group D).**

Case No.	Direct smear	Direct Urease test	Culture	Confirmatory tests				
				Ur	Ox	Ct	HUH	MT
9	-	-	-					
13	-	-	-					
21	-	-	-					
24	-	-	-					
25	-	-	-					
34	-	-	-					
38	-	-	-					
47	+	+	-					
48	+	+	-					

Ur: Urease test, Ox: Oxidase test, Ct: Catalase test.

HUH: Hippurate hydrolysis test; Mt: Motility test.

**Table (8): Bacteriological results of  
the different groups.**

	Direct film		Direct urease		Culture	
	+ve (%)	-ve (%)	+ve (%)	-ve (%)	+ve (%)	-ve (%)
<u>Group (A)</u> Duodenal ulcer  Total No. 17	16 94.1%	1 5.9%	16 94.1%	1 5.9	8 41.2%	9 58.8%
<u>Group (B)</u> Gastric ulcer  Total No. 10	6 60%	4 40%	6 60%	4 40%	5 50%	5 50%
<u>Group (C)</u> Non-ulcer dyspepsia  Total No. 12	9 75%	3 25%	9 75%	3 25%	6 50%	6 50%
<u>Group (D)</u> Control  Total No. 9	2 22.2%	7 77.8%	2 22.2%	7 77.8%	0 0%	9 100%



**Table (9): Relation of non-ulcer dyspepsia  
with and without endoscopic findings to  
the presence of *Helicobacter pylori*.**

	NUD with no endoscopic findings		NUD with endoscopic findings	
	No.	%	No.	%
<u>Direct film:</u>				
Total	4	100	8	100
+ve	3	75	6	75
-ve	1	25	2	25
<u>Culture:</u>				
Total	4		8	
+ve	2	50	4	50
-ve	2	50	4	50

**Table (10): Statistical analysis of the bacteriological results of different groups.**

	D. ulcer & G. ulcer	D. ulcer & NUD	Ulcers & NUD
<u>Direct smear:</u>			
$\chi^2$			
P value	0.04734 < 0.05	0.178 > 0.05	0.473 > 0.05
Significance	Significant	Not significant	Not significant
<u>Culture:</u>			
$\chi^2$		0.048	0.057
P value	0.598 > 0.05	0.82 > 0.05	0.81 > 0.05
Significance	Not significant	Not significant	Not significant

D. ulcer = Duodenal ulcer.

G. ulcer = Gastric ulcer.

NUD = Non-ulcer dyspepsia.

**Table (11): The results of the direct urease  
test in the different groups.**

	Within 2 hours		Within 12 hours	
	+ve (%)	-ve (%)	+ve (%)	-ve (%)
<u>Group (A)</u> Duodenal ulcer  Total No. 17	10 58.9%	7 40.1%	16 94.1%	1 5.9
<u>Group (B)</u> Gastric ulcer  Total No. 10	3 30%	7 70%	6 60%	4 40%
<u>Group (C)</u> Non-ulcer dyspepsia  Total No. 12	5 41.7%	7 58.3%	9 75%	3 25%
<u>Group (D)</u> Control  Total No. 9	1 11.1%	8 88.9%	2 22.2%	7 77.8%

**Table (12): Relation between direct film and culture in the dyspeptic groups (Groups A, B and C).**

	All dyspeptic groups		Total
	+ ve	- ve	
Direct film	31	8	39
Culture	19	20	39

$$X_1^2 = 6.74$$

$$P = 0.0094 (< 0.05).$$

**Significance: Significant.**

**Table (13): Incidence of *Helicobacter pylori* infection according to the residence in the different groups.**

	<i>Helicobacter pylori</i> infection		
	Total	Positive (%)	Negative (%)
Villages	29	25 (89.6%)	4 (10.4%)
Towns	19	8 (42.2%)	11 (57.8%)

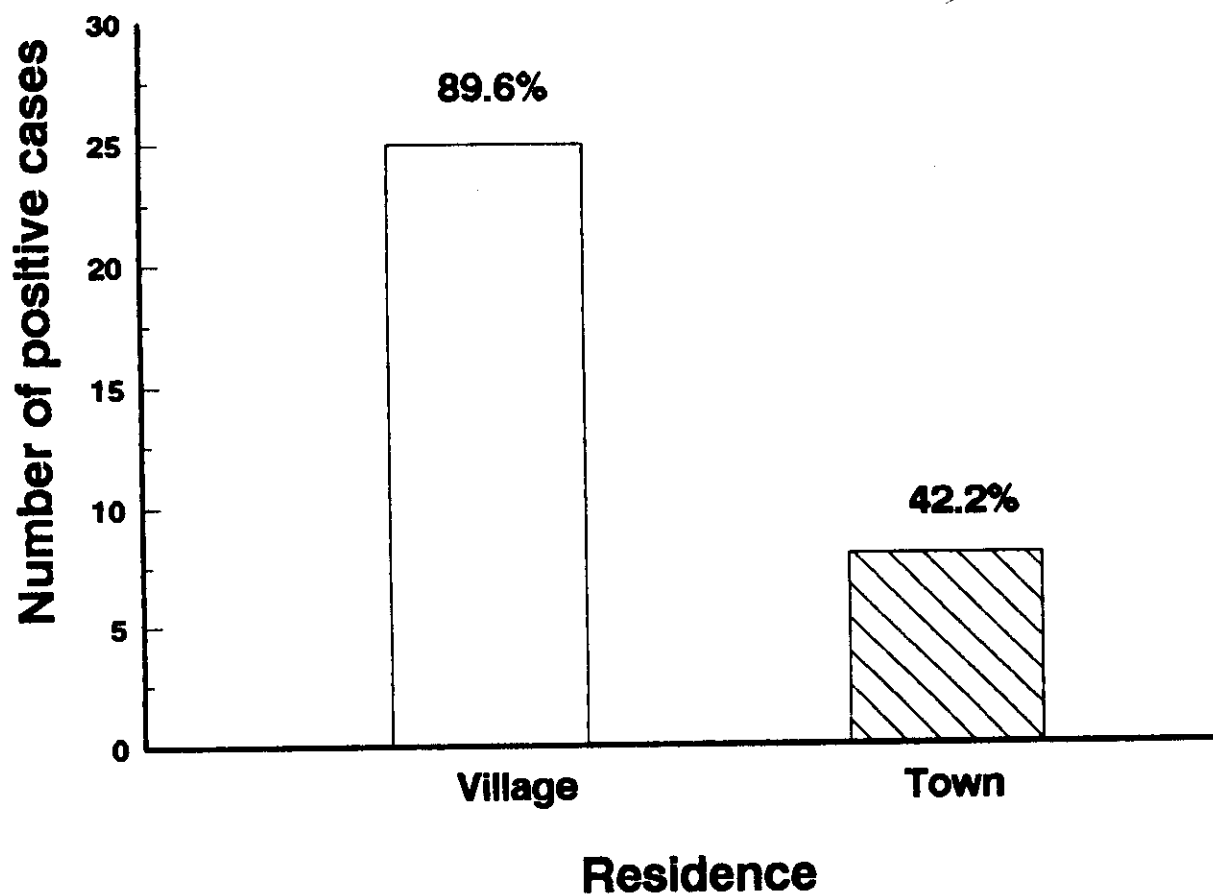
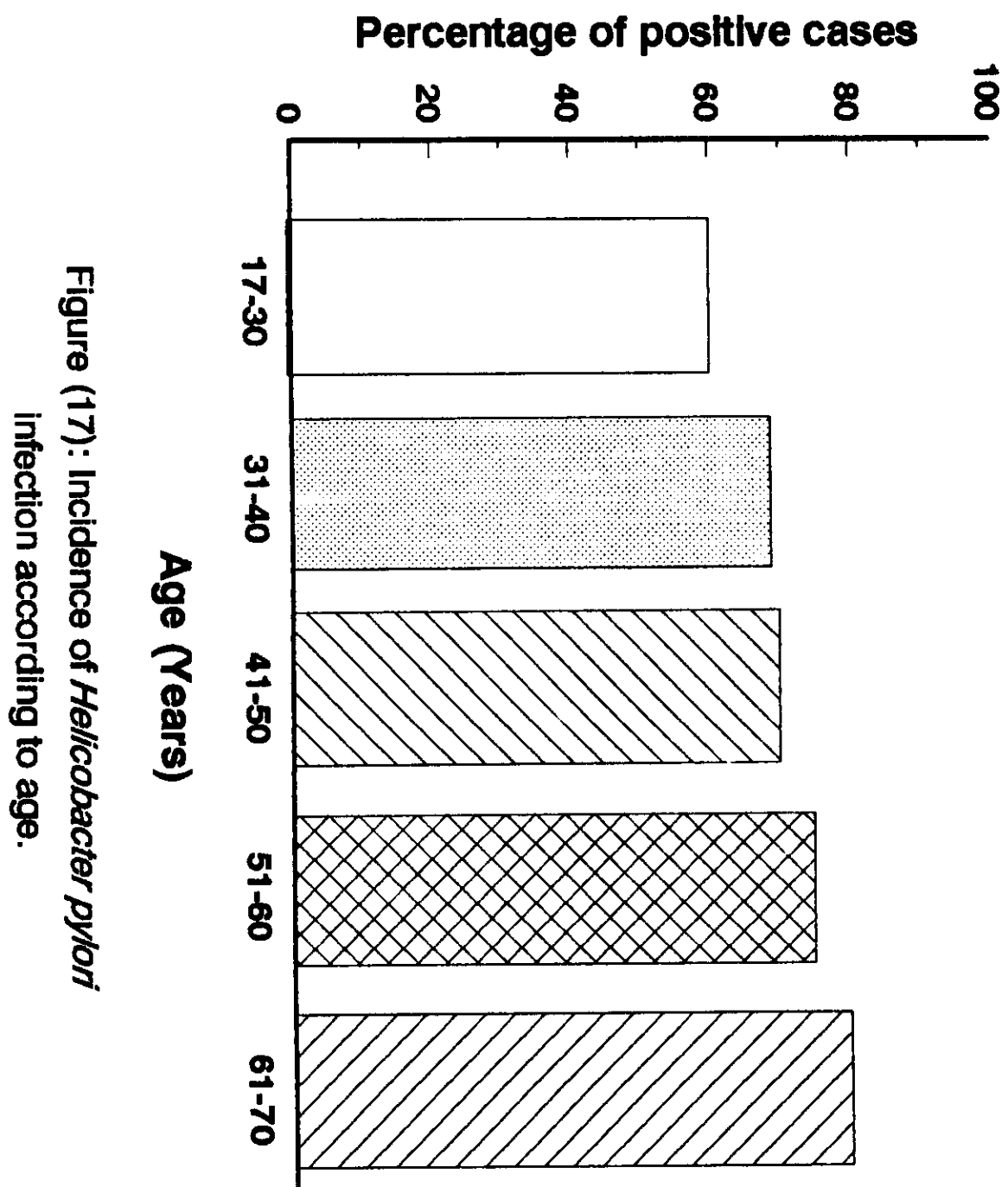


Figure (16): Incidence of *Helicobacter pylori* infection according to the residence.

**Table (14): Incidence of *Helicobacter pylori* infection according to the age groups in the different groups.**

	<i>Helicobacter pylori</i> infection		
	Total	Positive (%)	Negative (%)
<u>Group 1:</u> 17-30 years	16	10 (60.5%)	6 (39.5%)
<u>Group 2:</u> 31-40 years	13	9 (68.8%)	4 (31.2%)
<u>Group 3:</u> 41-50 years	10	7 (70%)	3 (30%)
<u>Group 4:</u> 51-60 years	4	3 (75%)	1 (25%)
<u>Group 5:</u> 61-70 years	5	4 (80%)	1 (20%)





**Table (15): Relation of *Helicobacter pylori* infection to sex.**

	Total	+ve (%)	-ve (%)
Female	20	11 (55%)	9 (45%)
Male	28	22 (78.5%)	6 (21.5%)

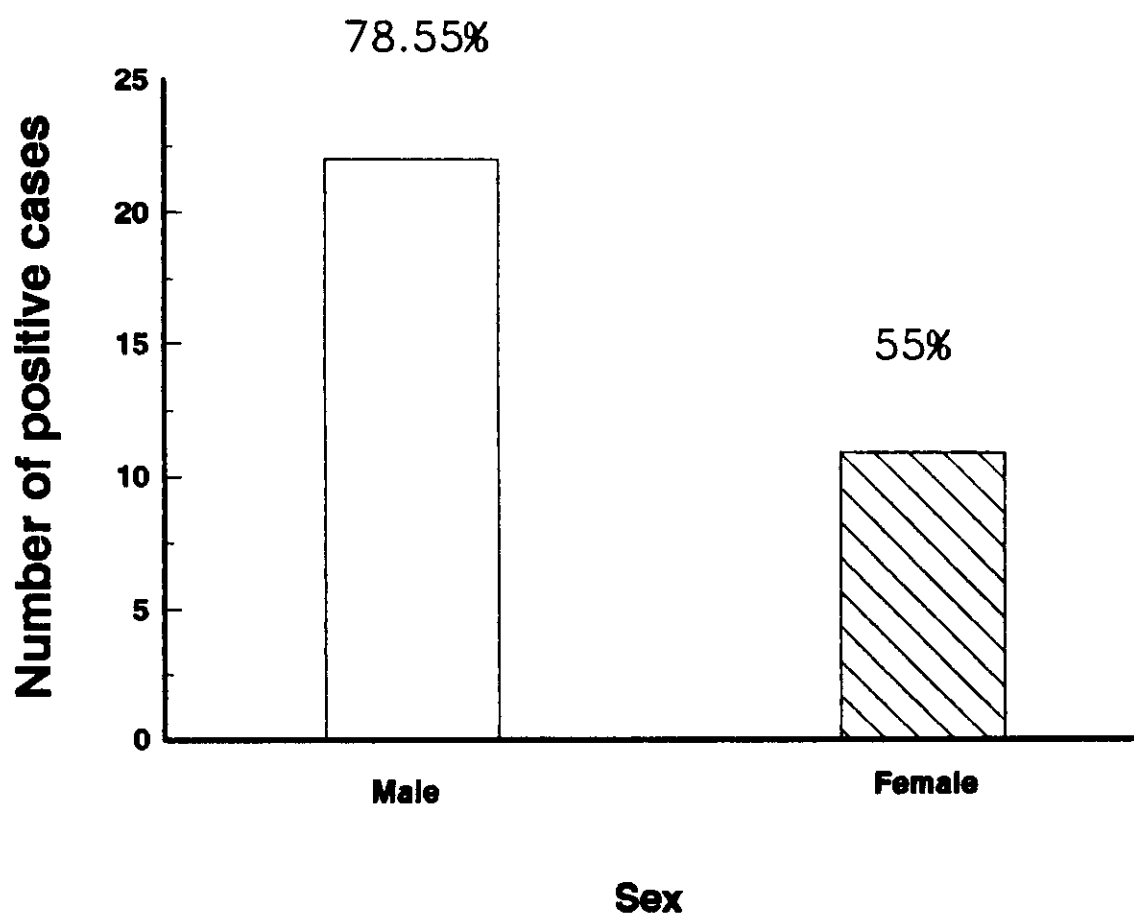


Figure (18): Relation of *Helicobacter pylori* infection to sex

**Table (16): Results of the antibiotic  
sensitivity test.**

No	Antibiotic	No. of strains	Susceptibility No. (%)	Resistance No. (%)
1	Ampicillin	19	All (100%)	Non (0%)
2	Amikacin	19	All (100%)	Non (0%)
3	Ceftizoxime	19	All (100%)	Non (0%)
4	Cephalothin	19	All (100%)	Non (0%)
5	Chloramphenicol	19	All (100%)	Non (0%)
6	Clindamycin	19	All (100%)	Non (0%)
7	Colistin	19	5 (26.3%)	14 (73.7%)
8	Erythromycin	19	All (100%)	Non (0%)
9	Gentamicin	19	All (100%)	Non (0%)
10	Kanamycin	19	All (100%)	Non (0%)
11	Nalidixic acid	19	Non (0%)	All (100%)
12	Nitrofurantoin	19	All (100%)	Non (0%)
13	Norfloxacine	19	All (100%)	Non (0%)
14	Penicillin	19	All (100%)	Non (0%)
15	Sulphafurazol	19	All (100%)	Non (0%)
16	Tetracycline	19	All (100%)	Non (0%)
17	Trimethoprim	19	Non (%)	All (100%)
18	Vancomycin	19	Non (%)	All (100%)