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THE POSSIBLE RELATION BETWEEN *HELICOBACTER PYLORI* INFECTION WITH BLOOD GROUPS , ANEMIA AND PERIPHERAL LYMPHOCYTE ELEVATION

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ABSTRACT

Biopsy were taken from 50 patients in order to cultivate *Helicobacter pylori* and blood samples to detect anemia , differential white blood cell count and blood groups .

The results showed that anemia was found in 48% of the patients while lymphocyte elevated in 44% of them , blood group O had the higher percentage (42%) in those patients among the other blood group types .

INTRODUCTION

Helicobacter pylori is a gram-negative microorganism that secretes many substances including ammoina , mucolytic enzymes (adhesins , catalase and urease) and acid secrete inhibitory proteins.(8) In addition to that it secrets toxin like vacuolating cytotoxin A (vacA).(7).

Adhesin allows the organism to adhere , catalase might protect the organisum from the immune system , urease increase the secretion of gastrin which stimulate the intestinal tissues to grow faster , and so could result in increased cancer risk .Urease is reponsible for hydrolyzing urea to NH_3 and CO2, and acts as also protective by forming an alkalin environment around the organism . The combination of NH_3 , Co_2 and inhibitory proteins allows the bacteria to setup locallized pockets where it can neutralize even the acidity of blood type O stomachs

The genetics of the secretor and non –secretor system interact to alter an individuals risk for ulcer. In several studies , non-secretors of ABO substances have been found to have significantly higher rate of duodenal and peplic ulcer .(8)

H. pylori infection increases the percentage of peripheral lymphocytes above the upper limit of referential values .(10)

Recent evidence suggests that *H. pylori* infection could cause iron deficiency anemia (IDA).(2). Adolescent femal athletes may have development of *H. pylori* associated (IDA) which can be managed by *H. pylori* eradication (5) . *H. pylori* may have a role in causing IDA in school-age children (3) .

MATERIAL AND METHODS

1-Biopsy samples :-

Biopsy samples were taken from 50 patients underlyed at endoscopy , samples then taken to the laboratory in order to cultivate them , samples transported in nutrient broth in a cold container , then grown on campylobacter selective agar consisting of 5% (v/v) sterile sheep blood in blood agar base No. 2 (oxoid) and skirrrows supplement (6 mg/ml Vancomyein , 2 mg/ml Nalidixic acid and 20 mg/ml after 2-3 days of incubation microaerophilic conditions . (12).

2-Blood samples :-

Blood samples collected from patients underlyed endoscopy in order to detect the anemia by sahli method , differential white blood cells count and blood groups .

Results

Diagnosis :

Diagnosis and culture results as described by the clinician was as fallow :-

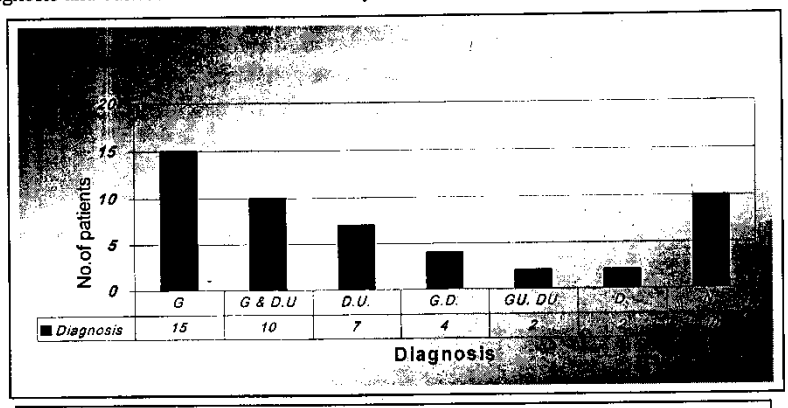

Fig.1: Distribution of disorders in 50 patients

The figure explains that (G) represented the higher disorder , then gastritis and duodenal ulcer (G&D.U) and normal cases (N=10 patients have no disorders) followed by duodenal ulcer (D.U) , gastritis and duodenitis (G&D) , gastric ulcer and duodenal ulcer (GU&DU) and duodenitis (D) respectively.

In general the infection with *H. pylori* reached to 70%

Blood groups test :-

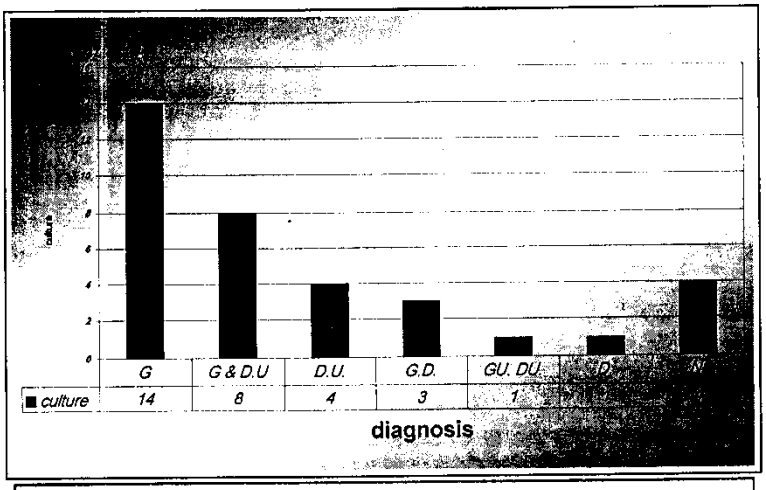

Fig.2 : Number of Positive cases in Culture .

It's obivious that gastritis had the higher percentage in positive cases in culture followed by G&D.U , D.U and normal cases , G&D , GU&DU and D respectively.

Blood group test:-

The following table shows the relation between the infaction with *H. pylori* and blood groups :-.

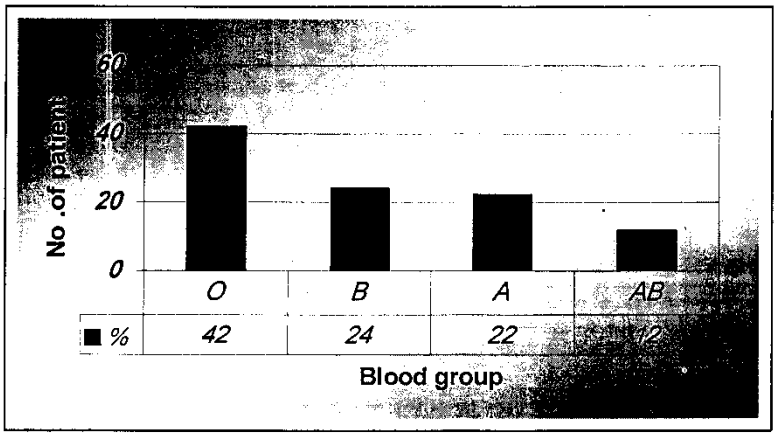

Fig. 3: Distribution of blood group in 50 patients

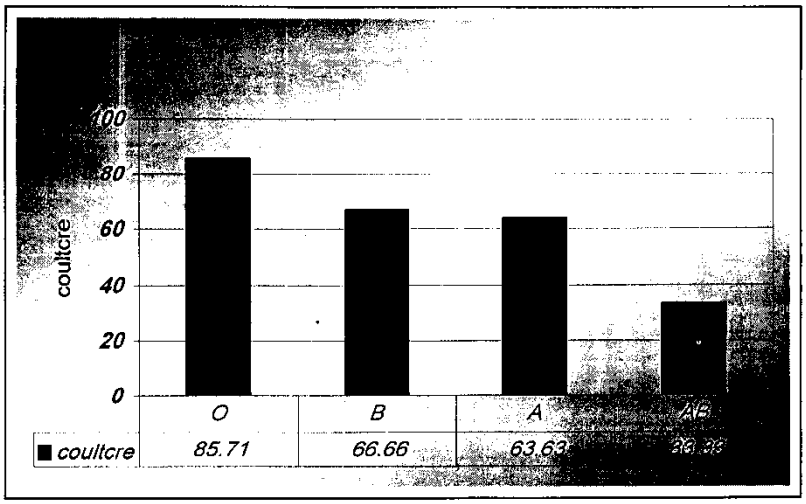

Fig.4: Distribution of positive cases in culture for each blood group

It's obvious that blood group O represented the higher percentage between the other blood groups and gave the higher percentage in culture results .

Differential Count :-

This test showed that 44% of the patients had a high number of lymphocytes in the peripheral blood .

Anemia :

anemia was found in 48% of the patients .

DISCUSSION

As it mentioned in the results , blood group O had the higheast percentage in the infection and related diseases , this might explain the association of ulcer disease with group O (non-secretors) .

Secretors secrete blood group substances into saliva and other bodily secretions recognized as immune substances (4). Reseachers suggested that secretor status might influence *H. pylori* to attach to gastroduodenal cells .

Because non-secretors are limited in their ability to secrete blood group antigens into the mucous secretion of their digestive tract , it has been proposed that they might be at competitive disadvantage to prevent *H. pylori* attachment . In other words , non-secretors lack of antigens in mucosal fluids might indirectly contribute to colonization by *H. pylori* , that's mean when specific antigens are free floating in the mucus , it probably acts to bind up some of *H. pylori* before it can contact and attach to the tissues . This might indicate that non-secretor's were unable to mount an aggressive immune response against this organism in comparison with their secretor individuals , evidence suggest that both bacterial colonization and the resultant ensuing inflammatory response are influenced , at least in part , by the ability to secrete blood group antigens . This relationship is strongest among blood type O non- Secretor .(8).

In Differential count of WBC it was obvious that lymphocyte number elevated in compared with the other cells types , this elevation was in 44% of the patients , this result agreed with (10) .

The elevation in lymphocyte population in the course of *H. pylori* infection indicated that this infection lead to gastric and duodenal mucosa inflammation (10) , this mean there is lymphocyte infiltration and iucrease in the peripheral blood lymphocytes (13) .

From the results obtained , 48% of the patients were suffering from anemia , this is not surprising because there is association between a type of anemia (Iron Deficiency anemia and *H. pylori*) infection (2,5,6,9,1) the acquisition of iron is a necessity for bacterial growth in *H. pylori* , as it is for other organisms , in addition to that iron is acritical factor for this organism , Therefor *H. pylori* isolates have the potent to express at least three major iron acquisition mechanisms .

This association of *H. pylori* infection with host iron – scavenging systems play an important a role (11) .

العلاقة الممكنة بين الإصابة بجرثومة الملوية البوابية ومجاميع الدم وفقر الدم وارتفاع مستويات الخلايا اللمفاوية المحيطية

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الخلاصة

اخذت عينات خزع من ٥٠ مريض خضع لفحص الناظور لاستبانات جرثومة Helicobacter كما اخذت عينات دم لتحديد وجود فقر الدم واجراء التعداد التفريقي لكريات الدم البيضاء وتحديد مجاميع الدم .

اظهرت النتائج ان فقر الدم كان موجود في ٤٨% من المرضى بينما ارتفع مستوى الخلايا اللمفاوية فـــي ٤٤% منهم ،كما ان مجموعة الدم اخذت اعلى نسبة ٤٢%بين مجاميع الدم الاخرى في هؤلاء المرضى.pylori

REFERENCES

1-Annibal , B. ; Marignani , M. ; Monarca , B. ; Antonelli , G. ;Marcheggiano , A. ; Martino , G. Mandelli , F. ;Oaprilli , R. and Delle Fave , G. (1999) . Reversal of iron defeciency after *Helicobacter pylori* eradication . In patients with a symptomatic gastritis J. Ann Intern Med. 131(9) : 668-672 .

2-Annibale , B.; Capurso , G.; Martino , G. ; Grossi , C. and Delle Fave , G. (2000) . Iron defeciency anaemia and Helicobacter infection . Int. J Antimicrob Agents . 16(4) : 515-519 .

3-Ashorn , M; Ruuska , T. and Makipernaa , A. (2001) . *Helicobacter pylori* and iron deficiency anaemia in children . Scan. J. Gastro enterol 36(7) : 701-705 .

4-Calam , J. (1995) . Bailler's clinical Gastroenterology Inter national practice and research (*Helicobater pylori*) . Calam , J. (ed.) . Bailler Tindall . London . pp : 487-506 .

5-Choe , Y. H. ; Hwang , T.S. ; Kim , H. J.; Shin , S.H. , Song , S.U. and Choi , M. S. (2001) Apossible gene to iron deficiency anemia . Helicobacter 6(1) : 55-59 .

6-Choe , Y.H; Lee , J. E. and Kim , S.K. (2000) . Effect of *Helicobacter pylori* eradication on sideropenic refractory anaemia in adolescent girls with *Helicobacter pylori* infection .Acta Paediatr.89 (2):154-157.(abstract)

7-Hamlet , A. and CoCoitoru , K. (2000) . Overview of immune and inflammatory changes due to *Helicobater pylori* infection . In : *Helicobater pylori* basic mechanisms to clinical cure . Hunt , R. and Tytgat , G. (eds) .Kluwer Academic Publishers London .pp : 141 – 209 .

8-Kelly . www . dadamo . com / napharm / stor 3 / template 2 / ulcer. Htm-33k-cached-

9-Konno , M. ;Muraoka , Takahashi , M. and Lami , T. (2000) . Iron defeciency anaemia associated with *Helicobacter pylori* gastritis .Pediatr .Gastroenterol. Nutr.31 (1):52-56. (abstract)

10-Maciorkowska , E.; Kaczmarski , M; Stasiak-Barmuta A. ;Kondej – Muszynska , K. ;: Kemora , A. Roszko , I. Ciesla , J. ;Zeielinska , A. and Gocal , M. (2003) .Peripheral blood lymphocyte population in children infected with *Helicobacter pylori* J. Annales Academiae Medicae Bialostocensis : 48: 95 – 99 .

11-Perez-Perez , G.I. (2000) . Role of iron in *Helicobacter* it's influence in outer membrane protein expression and in pathogenicity . Eur. J. Gastroenterol. Hepatol. 12(12) : 1263-1265 .

12-Sutton , P ; Wilson , J. and Lee , A. (2000) . Further development of *Helicobater pylori* model. Vaccine 18 : 2677 – 2685 .

13-Sutton , P. and Lee, A. (2000). *Helicobater pylori* vaccins the current status . Aliment pharmacol . Ther 14 : 1107 – 1118 .