CORRELATION OF SERUM PEPSINOGENS AND HELICOBACTER PYLORI INFECTION AMONG ADULT EGYPTIAN POPULATION

Hossam Fathy Abu El-khair,*Riham Abdel-halim Abu El-wafa, Walid Ismail El-lakany, Khalid Ahmed El-feel

Department of Tropical Medicine, *Department of Clinical and Chemical Pathology Faculty of Medicine, Alexandria University

Introduction

Helicobacter pylori (H. pylori) is a Gram-negative bacterium that colonizes the gastric mucosa. In Egypt, the Nile Delta has recorded an infection prevalence of around 70%. Chronic infection with H. pylori can progress to serious gastric diseases, including gastric cancer. However, the prevalence and assessment of gastric mucosa diseases, as well as H. pylori infection eradication through non-invasive measures such as serum pepsinogen (PG) screening, remain underexplored in Egypt.

Aim of the work

The primary objective of this study was to determine the relation between H. pylori infection and serum pepsinogen levels among the adult Egyptian population to enable clinician for early detection of gastric mucosa diseases, H. pylori eradication, and intervention implementation through endoscopy surveillance for better targeted treatment.

METHODS

The study recruited 100 participants from the Alexandria Main University Hospital. These participants were classified into three groups based on their H. pylori status, determined through the UBT and their presenting symptoms: Group I (symptomatic with H. pylori), Group II (asymptomatic with H. pylori), and Group III (healthy controls). After obtaining their signed informed consents, all participants underwent a comprehensive medical history assessment and a thorough clinical examination. We further investigated the serum levels of Pepsinogen I (PGI) and Pepsinogen II (PGII), as well as the PGI/PGII ratio. These parameters were analyzed for their correlation with H. pylori infection status, and intragastric H. pylori bacterial load (UBT values)

Results

There were no significant differences observed between Group I and Group II regarding serum concentrations of PGI and PGII, the PGI/PGII ratio, and UBT values. However, both PGI and PGII levels were significantly higher in H. pylori-infected individuals compared to the control group.

Conversely, the PGI/PGII ratio was lower and showed no significant difference in H. pylori-infected individuals compared to the control group. UBT values were also significantly higher in infected individuals, confirming the association between H. pylori infection and serum PG levels. In this study, ROC curve analysis confirmed the significance of Serum PGI and PG II levels as predictors of H. pylori infection. Notably, PGII exhibited higher sensitivity and specificity than PGI. In contrast, the PGI/PGII ratio demonstrated only a moderate discriminative ability, lacked statistical significance, and exhibited relatively low specificity, limiting its clinical utility. Our results demonstrated that both serum PGI and PGII are robust indicators of H. pylori infection, while the PGI/PGII ratio was found to be insignificant. We observed a statistically significant positive correlation between UBT values and serum PGI and PGII levels but not with the ratio.

Table (1):Distribution of the studied subjects (n=100) according to serum PG I, PG II concentration, PGI/PGII ratio and H pylori concentration

	Group I Symptomatic H pylori +ve patients (n=40)	Group II Asymptomatic H pylori +ve patients (n=40)	Group III Healthy control (n=20)	Test of significance
PG I serum concentration(ng/ml)				
Mean ±SD	63.65±47.99	76.63±65.3	23.74±23.33	KW=22.583
Median	54.15	65.04	8.09	p1=0.791
Min-max	17.64-269.27	7.21-400	3.05-72.85	p2=0.001* p3<0.001*
PG II serum concentration(ng/ml)				
Mean ±SD	9.63±5.53	13.62±17.44	1.72±1.41	KW=38.770
Median	9.66	8.97	1.18	p1=1.000
Min-max	0.96-24.90	1.7-102	0.16-5.70	p2<0.001* p3<0.001*
PG I/PG II ratio				
Mean ±SD	8.33±6.50	7.63±4.58	14.08±14.06	KW=3.220
Median	7.12	6.57	8.25	p=0.200
Min-max	1.75-32.37	1.5-21.0	2.8-62.06	
H pylori concentration (UBT value)				
Mean ±SD	140.68±63.71	139.0±58.88	16.75±6.50	KW=47.529
Median	130.5	125.0	7.12	p1=1.000
Min-max	55.0-315.0	54.0-296.0	2.81-1187.41	p2<0.001* p3<0.001*

ROC curve analysis of serum PGI and PGII as a predictor of H pylori infection among the studied subjects (n=100) AUC of PGII concentration as a predictor of H pylori infection is larger than that of PGI; reflecting better diagnostic ability of PGII concentration than that of PGI.
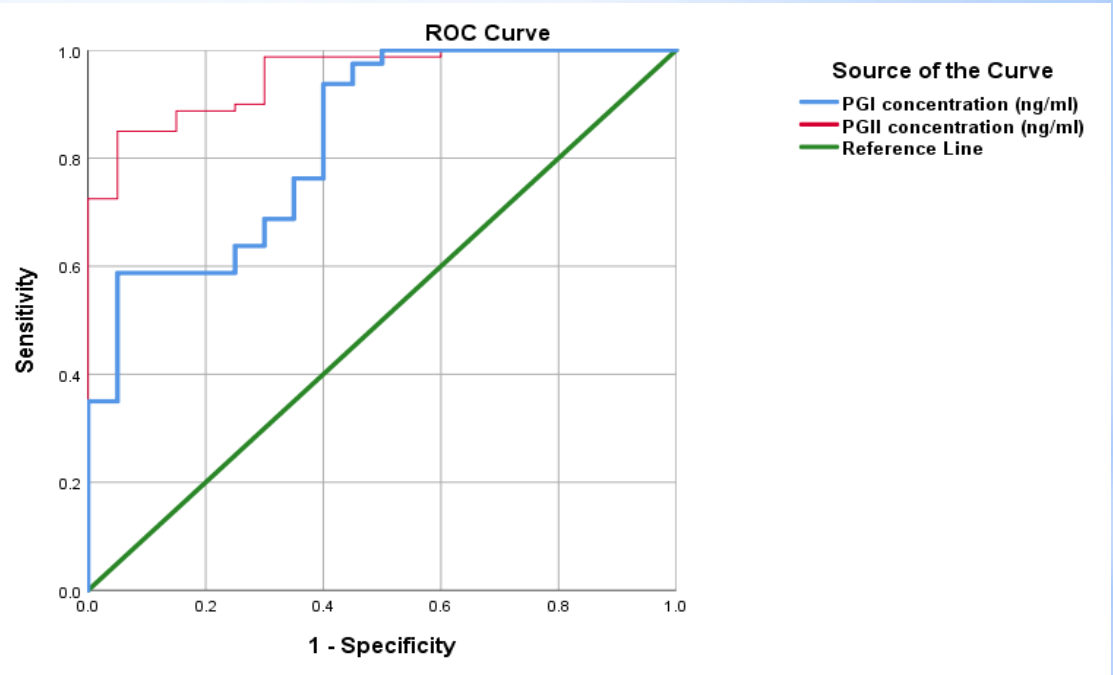
Conclusion

This study underscores the potential use of serum pepsinogen as a non-invasive biomarker for H. pylori infection in the Egyptian population. Our findings support the use of serum PG for early diagnosis, and monitoring of H. pylori-related gastric diseases, H pylori eradication and advocating for its integration into clinical practice.