Association of Helicobacter Pylori with Psoriasis in Kerbala Province, Iraq

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Abstract
Background Chronic immune-mediated disease with both cutaneous and systemic manifestations is psoriasis. It had been documented the presence of a link between certain types of microorganisms and the onset of Psoriasis and its worsening. Aim of the study: The aim of the study was to investigate the association between Helicobacter pylori and psoriasis and the severity of the disease. Methods Thirty-one psoriatic patients and thirty-one age and sex match healthy control subjects were enrolled. Blood samples were collected. The patients were classified according to PSAI score to mild, moderate, and sever cases. the presence of H. pylori antibody was detected by using rapid test cassette Statistical Analysis IBM SPSS version 24 software was used for analysis. Data were expressed as the frequencies, Means, Standard deviation were used, P value (P≤ 0.05) was considered statistically significant. Results: The current study revealed that 51.6% of psoriatic patients were seropositive to H. pylori IgG. there were significant association between the presence of H. pylori IgG and PASI score of severity. Patients with severe psoriasis had an H. pylori IgG positivity rate of 70%, while those with moderate psoriasis had a 72.7 % positivity rate. H. pylori IgG positivity was only found in 10% of patients with mild psoriasis. Conclusion Approximately 52 % of patients had H. pylori IgG. Significant association between the presence of H. pylori IgG and PASI score of severity was observed, thus, H. pylori could be considered as risk factor for psoriasis.
Keywords: Psoriasis, H pylori antibody, disease severity, PSAI score

1. Introduction

Psoriasis is a chronic immune-mediated inflammatory skin condition characterised by red, scaly plaques that most frequently appear on the elbows, knees, scalp, and lower back, however any area of the skin can be affected 1. The reported prevalence of this disorder ranged between 0.0 to 2.1 % among children and 0.91 to 8.50% among adults, worldwide 2.

Psoriasis has an unknown cause, the development of psoriasis is thought to be caused by a number of different factors, including genetic predisposition, environmental triggers, immune dysfunction and microbial infection.

An infection with H. pylori has been considered a possible contributor to the development of a number of immune-mediated skin disorders 3 Psoriasis and H. pylori have both been the subject of research conducted by a number of different studies. It has been found that psoriatic patients have a significantly higher prevalence of anti-H pylori antibodies compared to controls 3. Despite the fact that a number of studies have found According to some studies' results, therapies for H. pylori infection may help reduce the clinical symptoms of psoriasis 4. The fact that the local inflammation caused by H. pylori has systemic consequences supports its involvement in the development of other digestive symptoms. Based on the fact that the bacterium causes the inflammation, this function is assumed. The bacterium not only invades the gastric mucosa, but it also sets off a severe inflammatory response that releases an amount of cell-toxic substances. 5.

H. pylori is a microbe that can live in infected people for a number of decades even after they have been treated for the infection. Experimental and epidemiological studies currently demonstrate a strong relation between H. pylori infection and the development of a wide range of extra-gastric diseases, including a number of allergic and autoimmune diseases. This relationship is supported by the fact that H. pylori infection is associated with the development of these diseases. The hypothesis that H. pylori can exacerbate psoriasis in individuals who are genetically predisposed to the condition by interfering with and amplifying immune responses has been supported by a number of studies. In addition to this, H. pylori infections are found at a significantly higher rate in psoriasis patients than in healthy controls. 6. The association of these bacterial pathogens and the disease severity were not documented among Iraqi Psoriatic patients' resident in Kerbala Province.

Thus, the aims of the study were To Study the association of H. pylori infection with the disease severity among Psoriatic patients. In addition to study the association of certain risk factor like sex and age with the disease severity among Psoriatic patients.

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2. Method

The current study was designed as case control study. Out of 31 patients with Psoriasis and 31 age and sex matched healthy control were involved. The time period for samples collection took about six months in an outpatient clinic, and the samples were examined in an external laboratory. All clinical details of patients and controls were recorded according to prepared questionnaire after taking oral acceptance to participate in the current study. According to their PASI score, the patients were divided into three groups: mild (PASI 10), moderate (PASI 10-29), and severe (PASI > 30).

Five milliliters of venous blood were drawn from all participants. After centrifugation at 4000 xg, serum samples was used to analyze the presence of *H. pylori* antibody using rapid test cassette(ACON) and the procedure was followed according to manufacturer.

3. Statistical Analysis

Statistical analysis was carried out using IBM SPSS version 24. To determine the association between categorical variables, the Chi-square test, The 95% confidence interval (CI), odds ratio, and were used. P 0.05 was regarded as the statistically significant value.

4. Results

As shown in table (1), Fourteen out of 31 patients were males (45.2 %) and 17 were females (54.8%). The age of the patients was ranged from 2 to 49 years with mean age of 21.13 ± 13.03. Ten of the patients had mild,11 moderate, and 10 had sever PSAI score. Four patients were smokers and one had diabetes mellitus.

Table (1): Demographic data of patients and control

Variables	Patients	Control
Studied population	31	31
Age-group (Years)		
≤15	12(38.7%)	12(38.7%)
16-30	12(38.7%)	12(38.7%)
31-50	7(22.6%)	7(22.6)
Sex		
Male	14(45%)	14 (45%)
Female	17(55%)	17 (55%)
Diabetes mellitus (DM)		
With DM	1(3.33%)	0 (0%)
Without DM	30 (96.77%)	31 (100%)
Hypertension		
Hypertensive	1(3.33%)	0 (0%)
Non-hypertensive	30 (96.77%)	31 (100%)
Smoking		
Smoker	4(12.9%)	0(0%)
Non-smoker	27(87.1%)	31(100%)
Psoriasis score (PASI)		
Mild	10(32.25%)	0 (0%)
Moderate	11(35.5%)	0 (0%)
Sever	10(32.25%)	0 (0%)
Heart disease		
With Heart disease	0(0%)	0(0%)
Without Heart disease	31(100%)	31(100%)
Cancer		
With cancer	0(0%)	0(0%)
Without cancer	31(100%)	31(100%)
Psoriatic Arthritis (PsA)		
With PsA	0(0%)	0(0%)
Without PsA	31(100%)	31(100%)

Distribution of age and Sex among Psoriatic patients

As shown in table (2), More than 78.5 % and 76.47% of male and female patients, respectively were in age below 30 years. The statistical analysis involved in this study did not find a significant difference between the age groups with sex.

Table (2): Age and Sex distribution among Psoriatic patients

Sex	Age group			Total
	≤15 years	16-30 years	31-49 years	
Male	4(28.6%)	7(50%)	3(21.4%)	14(100%)
Female	8(47.1%)	5(29.4%)	4(23.5%)	17(100%)
Total	12(38.7%)	12(38.7%)	7(22.6%)	31(100%)

Seropositivity to H. pylori and psoriasis

The current study revealed that 16 (51.6%) of psoriatic patients were seropositive to H. pylori IgG. None of the control subjects showed seropostivity. A statistical analysis revealed a highly significant association between H. pylori seropositivity and psoriasis. As shown in table (3) below.

Table (3): Comparison of *H. pylori* IgG between patient groups with psoriasis disease and control group.

Study group	H. pylori IgG					
	Positive N (%)	Negative N (%)	Total N (%)	p-value	Odds ratio	95% CI
Patients	16 (51.6%)	15 (48.4%)	31(100%)	0.001*	67.06	3.77 - 1192.92
Control	0 (0%)	31 (100%)	31 (100%)			
Total	31 (100%)	31 (100%)	62(100%)			
*P ≤ 0.05 was considered statistically significant; CI: confidence interval						

The Association of H. pylori with severity of Psoriasis

As shown in table (4) below, there were significant association between the presence of H. pylori IgG and PASI score of severity. Patients with severe psoriasis had an H. pylori IgG positivity rate of 70%, while those with moderate psoriasis had a 72.7 % positivity rate while only 10% of patients with mild psoriasis had H. pylori IgG positivity.

Table (4): the association of PSAI score and *H. pylori* IgG antibody

PASI	H. pylori IgG			
	Positive N (%)	Negative N (%)	Total N (%)	*P*-value
Mild	1 (10%)	9 (90%)	10 (100%)	0.006*
Moderate	8 (72.7%)	3 (27.3%)	11 (100%)	
Severe	7 (70%)	3 (30%)	10(100%)	

* $p \leq 0.05$ was considered statistically significant; PSAI: Psoriasis Area Severity Index.

The distribution of *H pylori* IgG with the age of Psoriasis

The current study revealed that 50%, 75%, and 36.36% of psoriatic patients had the psoriatic lesion for less than 5 years, less than 10 years, and more than 10 years, respectively. As shown in table (5) below.

Table (5): Cross-tabulation of *H pylori* seropositivity according to age of psoriasis

Age of psoriasis	*H pylori IgG* N *(%)*		Total
	Positive	Negative	
less than 5 years	6 (50)	6 (50)	12 (100)
less than 10 years	6 (75)	2 (25)	8 (100)
more than 10 years	4(36.4)	7(63.6)	11 (100)
Total	16(51.6)	15(48.4)	31 (100)

The association of H. pylori with the site of the lesion

The results of the current study revealed that 43.75% of H. pylori seropositive patients had the psoriatic lesion in all of the body and 18.7% had the lesion on abdomen and back of their body, as show in the below table (6).

Table (6):Cross-tabulation of H pylori seropositivity according the site of psoriatic lesion

Psoriatic lesion site	H pylori IgG N (%)		Total
	Positive	Negative	
abdominal and back	3(18.7)	0(0)	3
abdominal and genital	1(6.25)	0(0)	1
abdominal and hand	1(6.25)	1(6.66)	2
all body	7(43.75)	3(20)	10
Head	1(6.25)	6(40)	7
head and back	1(6.25)	0(0)	1
Legs	0(0)	2(13.3)	2
legs and back	0(0)	1(6.66)	1
legs and hands	2(12.5)	1(6.66)	3
Nails	0(0)	1(6.66)	1
Total	16(100)	15(100)	31

5. Discussion

Over the years, the idea that infection may play a part in the development of psoriasis has been suggested, although there is no definite evidence. H. pylori has recently received attention as a potential etiological factor. The chronic, endemic, and asymptomatic nature of H. pylori infection are make the research intriguing 7. Dermatology and gastroenterology both have difficulties in understanding the connection between psoriasis and H. pylori 8.

Distribution of age and Sex among Psoriatic patients

As shown in table (2), most of the patients were in age below 30 years. No significant difference between the age groups with sex of psoriatic patients was found. This finding is in agreement with a previous study 9. Also, in another study, no significant differences was observed between both sex 10.

The association of H. pylori seropositivity with Psoriasis

The current study revealed that approximately 52% of psoriatic patients were seropositive to H pylori IgG. Highly significant association between H. pylori seropositivity and psoriasis was observed. Lower prevalence rate (40%) was documented by previous study11.

In another study conducted by Mannucci et al., H. pylori antibodies were found in 8 (33.3%) of the control groups and 16 (64%) of the psoriatic patients (p =0.04), 12. Inversely, a different research conducted by Sonnenberg and Gentarevealed found that the prevalence of H. pylori positivity was the same in patients and controls 13. Furthermore, Azizzadeh et al., reported that ten (16.4%) of the psoriatic patients and eight H. pylori seropositive test results were found in (13%) of the control groups; Patients with psoriasis had an average IgG serum level of 17.3 IU/ML. and 16.1 IU/ML in the control group8.

H. pylori infection has been associated with a variety of extra-gastrointestinal disorders. It is debatable whether H. pylori infection worsens or initiates the pathogenesis of psoriasis14.The potential pathogenesis of H. pylori is by causing Chronic inflammation of the stomach lining15. Although the infection is not invasive, it causes a significant local inflammatory response as well as a systemic immune response16. It is thought that H. pylori causes increased gastrointestinal permeability. As a result, antigenic exposure is prolonged. Furthermore, the structural antigens of this bacteria can act as super antigens, contributing to the etiopathogenesis of some diseases.17. H. pylori antigens activate cross-reactive T cells and induce the production of autoantibodies 18. H. pylori could be a trigger for psoriasis. Because of the prolonged interaction between the bacterium and the host immune mechanisms, H. pylori is a possible infectious agent for causing

autoimmunity19.

The Association of H. pylori with severity of Psoriasis

As shown in table (4) High prevalence of H pylori seropositivity was seen in patients with severe and moderate PSAI score (70%, and 72.7%, respectively). Similarly, according to a meta-analysis study, Patients with moderate and severe psoriasis had a greater rate of H. pylori infection than patients with mild psoriasis4. Campanati et al., and Xu et al., established that higher levels of seropositivity were associated with severe psoriasis and hypothesized that H. pylori could be at least a contributing factor to psoriasis (Campanati et al., 2015;Xu et al., 2016). Additionally, another study revealed that patients with successfully eradicated H. pylori infections experienced greater improvements in their psoriasis than other patients.22. This might suggest that the severity of the psoriasis and the H. pylori infection needed more attention during clinical treatment.

The association of H. pylori with the site of the lesion

The results of the current study revealed that 43.75% of H. pylori seropositive patients had the psoriatic lesion in all of the body and 18.7 % had the lesion on abdomen and back of their body. Marae et al., (2021) It has been shown that patients without palm and sole affection had a higher prevalence of H. pylori infection. However, In 50% of individuals with afflicted soles and palms, H. pylori infection was found. (P = 0.02) 15

Hübner and Tenbaum, described a case of a 35-year-old man, who presented symptoms consistent with Palmoplantar pustulosis, and the presence of H. pylori infection was confirmed by a 13C-urea breath test. They concluded that Palmoplantar pustulosis is an abnormal immunologic response to a variety of bacterial or viral infections, and that H. pylori infection may have caused Palmoplantar pustulosis in their patient23.

A study conducted by Marae et al., revealed a statistically significant correlation between the mean anti-H. pylori IgG and nail involvement. (P = 0.05), It could be because nail psoriasis is frequently associated with inflammation at the insertion points of tendons and ligaments, resulting in enthesitis.

Dopytalska et al.,reported that 23-27% of psoriasis patients had unique localizations on their nails, 49% have them on their faces, 12-16% have them on their palms and soles, and up to 36% have them in intertriginous regions 24.

The distribution of H pylori IgG with the age of Psoriasis

The current study revealed that 50%, 75%, and 36.36% of psoriatic patients had the psoriatic lesion for less than 5 years, less than 10 years, and more than 10 years, respectively. Borsky et al., documented that the chronological age difference was significantly higher in female patients than in female controls25.

According to a study by Chiriac et al., 263 cases (21.28%) had their first official psoriasis diagnosis before the age of 19, and 104 cases (8.41%) had their psoriasis onset before the age of 10. Adult psoriasis accounted for the majority of cases, 869 (70.31%)26.

According to reports, psoriasis is a chronic condition that manifests in one-third of patients within the first two decades of life27.One-third of psoriatic patients acquire the condition when still children, according to the findings of many prevalence studies28. Furthermore, it was shown that psoriasis incidence rates were rapidly rising till the ages of 30-3529.

6. Conclusions

Approximately 52 % of patients had H. pylori IgG. Significant association between the presence of H. pylori IgG and PASI score of severity was observed. Out of 70% Patients with severe psoriasis had H. pylori IgG positivity rate, while those with moderate psoriasis had a 72.7 % positivity rate. Only 10% of patients with mild psoriasis had H. pylori IgG positivity. Thus, H. pylori could be considered as risk factor for psoriasis.

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