Original Article

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Prevalence of Helicobacter Pylori Infection Among Patients with Psoriasis

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[1,3]Substantial contributions to the conception or design of the work; or the acquisition, [2,4]Active participation in active methodology, [2,3]analysis, or interpretation of data for the work, [5,6]Drafting the work or revising it critically for important intellectual content

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ABSTRACT

Objective: To determine the frequency of Helicobacter pylori infection in patients with psoriasis.

Methodology: This cross sectional descriptive study was done at Department of Dermatology, Liaquat University of Medical and Health Sciences Hospital, Jamshoro/Hyderabad, from August 2019 to February 2020. All subjects with psoriasis were further evaluated for the Helicobacter pylori infection by taking 2cc venous blood sample and sent to the laboratory for analysis. The Helicobacter pylori infection was labeled as positive and negative according to the cut off values. Descriptive statistics were calculated. Stratification was done and post stratification Chi Square test was applied. P-value ≤0.05 was taken as significant.

Results: There were 58.2% male and 41.8% female patients. Mean age was 48.17±7.28 years. Mean disease duration was 4.44±1.90 years. it was observed that 64.6% patients were from urban and 35.4% were from rural areas. Helicobacter pylori infection was observed in 68.4% patients. Results showed significant association of helicobacter pylori infection with iron deficiency anemia.

Conclusion: The study found a high frequency of Helicobacter pylori infection (68.4%) among patients with psoriasis, suggesting a possible association between the infection among males, younger individuals, hypertensive patients, and urban residents.

Keywords: Helicobacter pylori, infection, psoriasis.

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Introduction

Psoriasis is an immune-mediated chronic inflammatory dermatological condition. It is characterized by erythematous plaques with dry, silvery scales on scalp, superficial fascia, extensor, lumbosacral, intertriginous, and genital regions.[1] Its global prevalence ranges between 0.09% and 11.43%, with regional disparities showing highest burden in developed countries and lowest in developing and under-developed nations. [2,3] The psoriasis exhibits a multifactorial pathogenesis with a complex relationship between genetic, environmental, and immunological factors. Immune deregulation plays a central role in its pathophysiology by activating T-helper 1 (Th1) and T-helper 17 (Th17) pathways, leading to hyper-proliferation of keratinocyte and chronic skin inflammation.[4] Although recent studies have extensively explored the role of systemic immune responses altered by infectious agents including *Helicobacter pylori* (H. pylori) in development and progression of psoriasis, a comprehensive understanding of etiology and pathogenesis is hard to pin down.[5]

Helicobacter pylori, a spiral-shaped and microaerophilic Gram-negative bacterium, inhabits the gastric mucosa of around 43% of global population, with a well-

documented pathogenic role in peptic ulcer disease, chronic gastritis, and gastric carcinoma. [6] A growing body of evidence suggests a potential role of H. pylori in several extra-gastrointestinal conditions, such as autoimmune or inflammatory disorders including idiopathic thrombocytopenic purpura, iron deficiency anemia, rosacea, chronic urticaria, and psoriasis. These conditions result from several mechanisms adopted by the H. pylori, including systemic immune responses, altered cytokine profiles, and cross-reactivity, leading to disease development and progression through chronic infection. [7]

The potential relationship between *H. pylori* infection and psoriasis has drawn considerable attention of researchers over the past two decades. However, the studies produced either questionable or contradictory findings. Some studies suggest that *H. pylori* may trigger psoriasis among genetically susceptible individuals, while other studies advocate the aggravating role of H. pylori in existing psoriasis through perpetuation of systemic inflammation. The researchers have proposed that Hyper-production of pro-inflammatory cytokines is the possible mechanisms for development and exacerbation of psoriasis. Moreover, *H. pylori* infection may play a role in increased intestinal permeability and gut microbiota imbalance, contributing to systemic inflammatory conditions, including psoriasis.[8] In contrast, some studies reported a non-significant association between *H. pylori* infection and psoriasis, while others even documented an inverse relationship, suggesting protective effect of *H. pylori*. [9-11] Besides these contradictory findings, high prevalence of *H. pylori* up to 72% among psoriasis patients still warrants further exploration of their prevalence and possible association. This, in case of positive correlation between psoriasis and *H. pylori*, will produce imperative clinical implications, potentially contributing to disease management strategies. Conversely, if not, it would provide clarification of psoriasis pathogenesis, redirecting future research towards more promising path.[12]

However, interaction between systemic inflammation and infection is bidirectional in nature. Chronic inflammatory responses in psoriasis may facilitate *H. pylori* colonization through impaired mucosal immunity potentially compromised by the psoriasis-associated multiple comorbidities. Exploring the link between H. pylori and psoriasis is important, as it may reveal a modifiable factor that influences disease severity. This study aims to assess the prevalence of H. pylori infection among patients diagnosed with psoriasis. Given the high prevalence of both conditions, the study may address a significant gap in local research. If an association is confirmed, it could support the inclusion of H. pylori screening in psoriasis management, potentially improving patient outcomes.

Methodology

The study was conducted at the Department of Dermatology, Liaquat University of Medical and Health Sciences Hospital, Jamshoro/Hyderabad, over a period of six months, from August 2019 to February 2020. The sample size was determined based on the prevalence of Helicobacter pylori in psoriasis (72%) and a desired precision (d=7), resulting in a total of 158 psoriasis patients included in the study. Non-probability consecutive sampling was used for participant selection. The study design was cross-sectional and descriptive in nature. Inclusion criteria included patients with psoriasis for at least one year, aged between 20 and 60 years, of either gender, who visited the dermatology outpatient department at Liaquat University Hospital. Patients with autoimmune disorders, hyper/hypothyroidism, pregnant or lactating women, and those already undergoing Helicobacter pylori eradication therapy were excluded from the study. The presence of these conditions was verified through previous hospital records and diagnosis cards provided by relevant healthcare providers. Data collection was conducted after obtaining approval from CPSP. Psoriasis patients who presented to the dermatology OPD were recruited and examined under the supervision of a consultant dermatologist with a minimum of five years of clinical experience. Informed consent was obtained from all participants, and blood samples (2cc venous blood) were collected using sterile equipment by the principal investigator for Helicobacter pylori analysis. The samples were sent to the laboratory, where they were evaluated by a senior pathologist with over five years of experience. Helicobacter pylori infection was classified as positive or negative based on established cut-off values. Effect modifiers were also explored. Data was collected using a pre-designed proforma, and all financial expenses related to the study were covered by the researcher. This study adhered to its objectives and implemented appropriate exclusion criteria to minimize bias or confounding factors. Finally, data analysis was performed using SPSS version 17.0.

Results

Overall 158 patients were included in the study, the majority (68%) were older than 45 years, with a mean age of 48.17 ± 7.28 years. Majority of the cases (66%) had a disease duration of more than 3 years, with an average duration of 4.44 ± 1.90 years. Out of all study participants, males were 58.2% and 41.8% were females. A higher proportion of patients (64.6%) resided in urban areas compared to 35.4% from rural settings. According to comorbid conditions, 40.5% had hypertension, 12.7% were smokers, 33.5% were obese, and 19.6% had diabetes mellitus. (Table I)

Table I: Descriptive statistics of patients. (n=158)

Age Group	N	%
≤ 45 years	51	32%
> 45 years	107	68%
Mean ± SD	48.17±7.28	
Disease Duration		
≤ 3 Years	54	34%
> 3 Years	104	66%
Mean ± SD	4.44±1.90	
Gender		
Male	92	58.2%
Female	66	41.8%
Residence		
Urban	102	64.6%
Rural	56	35.4%
Hypertension		
Yes	64	40.5%
No	94	59.5%
Smoking		
Yes	20	12.7%
No	138	87.3%
Obesity		
Yes	53	33.5%
No	105	66.5%
Diabetes Mellitus		
Yes	31	19.6%
No	127	80.4%

Out of all patients, the Helicobacter pylori infection was present in 108 individuals, accounting for 68.4% of the total sample. The remaining 50 patients (31.6%) tested negative for the infection, indicating a high prevalence of H. pylori among the study population. (Table II)

Table II: Frequency distribution of Helicobacter Pylori infection. (n=158)

H. pylori	Frequency	Percent
Yes	108	68.4%
No	50	31.6%

H. pylori infection found to be more common among males, younger patients, urban residents, and those with hypertension, obesity, and diabetes; however, none of these associations were statistically significant (p > 0.05). The highest prevalence was noted in hypertensive patients (76.6%), approaching significance (p = 0.067). (Table III)

Table III: Distribution of Helicobacter Pylori Infection according to study variables. (n=158)

Variables	H. Pylori Infection		Total	P-Value
	Yes	No		
Gender				
Male	64 (69.6)	28 (30.4)	92	0.699**
Female	44 (66.7)	22 (33.3)	66	
Age Group				
≤45 Years	36 (72)	14 (28)	50	0.503**
>45 Years	72 (66.7)	36 (33.3)	108	
Disease Duration				
≤3 Years	37 (69.8)	16 (30.2)	53	0.780**
>3 Years	71 (67.6)	34 (32.4)	105	
Residence				
Urban	70 (68.6)	32 (31.4)	102	0.921**
Rural	38 (67.9)	18 (32.1)	56	
Hypertension				
Yes	49 (76.6)	15 (23.4)	64	0.067**
No	59 (62.8)	35 (37.2)	94	
Smoking				
Yes	13 (65)	7 (35)	20	0.730**
No	95 (68.8)	43 (31.2)	138	
Obesity				
Yes	37 (69.8)	16 (30.2)	53	0.780**
No	71 (67.6)	34 (32.4)	105	
Diabetes Mellitus				
Yes	22 (71)	9 (29)	31	0.727**
No	86 (67.7)	41 (32.3)	127	

*Chi Square Test was applied; P-value ≤0.05 considered as Significant; **Not Significant at 0.05 levels.*

Discussion

Psoriasis is a chronic inflammatory skin condition with a complex etiology involving genetic and environmental factors that impair immune function. While the exact cause of psoriasis remains unclear, research suggests a link between psoriasis and metabolic syndrome, as well as the potential role of microorganisms in worsening the disease. *Helicobacter pylori*, a gram-negative bacterium associated with gastric diseases,[14,15] have been hypothesized to trigger the development of psoriasis. In the present study, 158 patients of both genders, aged 20-60 years, were evaluated to determine the frequency of *Helicobacter pylori* infection in psoriasis patients. The majority of participants were male (58.2%) and urban residents (64.6%), with a mean age of 48.17 ± 7.28 years and mean disease duration of 4.44 ± 1.90 years. These findings align with a hospital-based study by Kumar et al[16] which reported a higher prevalence of *H. pylori* among male psoriasis patients, with a male-to-female ratio of 1.1:1. Similarly, Sohail et al[17] from Pakistan found that most psoriasis patients were male and under

40 years of age. However, our study contrasts with Aboeldahab's study, where psoriasis was more prevalent among rural residents than urban (53% vs. 47%, respectively).[18] The some variations across the studies for demographic characteristics may be attributed to variations in demographic factors, regional characteristics, or the study designs and sample selection criteria.

In this study, 12.7% of subjects were smokers, 40.5% were hypertensive, 33.5% were obese, 19.6% had diabetes, 11.4% had iron deficiency anemia, and 9.5% had vitamin B12 deficiency. These findings are consistent with the study by Phan et al[19] who reported a higher prevalence of metabolic and cardiovascular comorbidities in psoriasis patients, including obesity (24%), hypertension (26%), and diabetes (11%). However, their study documented a lower smoking prevalence (32.5%) compared to our study. In contrast, Khan et al[20] reported a younger mean age (34.8 ± 14.71 years), with 58% males, 26.9% smokers, 11.6% hypertensive, and 5.8% diabetic psoriasis patients. Their findings showed a lower prevalence of hypertension and diabetes but a higher proportion of smokers compared to our study. These differences may be attributed to variations in the sample population, regional health profiles, or atmospheric variations.

In this study, *Helicobacter pylori* infection was found in 68.4% of psoriasis patients. This is higher than the 50.3% prevalence reported in a recent systematic review and meta-analysis by Yan et al. In contrast, Anas et al[21] reported a lower prevalence of 48% in psoriasis patients, which is considerably lower than our findings. On the other hand, Mesquita et al[22] found a much higher prevalence of 72.07% in psoriasis patients, which exceeds our study's results. These observed differences in the prevalence of *H. pylori* infection could be attributed to regional variations, differences in the study populations, or the methodologies used for detecting the infection.

In this study, stratification of potential risk modifiers showed that *H. pylori* infection was slightly higher among males and younger patients of age 45 years or below (70% and 72% respectively) compared to females and those aged above 45 years (68% and 67% respectively). However, there was no statistically significant difference between the groups ($p>0.05$). These findings are supported by the study of Khan,[23] who found that higher proportion of males (69%) was diagnosed with H. pylori on endoscopic biopsies than females (63%), but statistically non-significant difference was seen between groups. Moreover, the researcher suggested that H. pylori infection is acquired in younger age. In a more recent study from China, Qiao et al.[24] reported a slightly higher rate of H. pylori infection among males (49.74%) than the females (49.3%), with statistically significant difference ($P < 0.01$). They further observed that H. pylori risk was significantly lower among younger female and male patients than the older counterparts ($P<0.01$).

In this study, patients with a psoriasis duration of 3 years or less had a slightly higher prevalence of *Helicobacter pylori* infection (70%) compared to those with a disease duration of more than 3 years (68%). However, the difference was not statistically significant ($p > 0.05$). Similarly, Poudel et al[25] reported a higher prevalence of *H. pylori* in psoriasis patients with a disease duration of 16-20 years (100%) compared to those with a shorter duration, although the difference was also not statistically significant ($p = 0.140$). Azizzadeh et al[26] also observed a higher proportion of *H. pylori* infection in patients with longer disease duration. These findings suggest that while there may be an association between disease duration and *H. pylori* infection, the difference is not statistically significant, indicating that other factors may also play a role. This study also has several limitations including cross-sectional design, limiting the ability to establish causal relationships between *H. pylori* infection and psoriasis. Furthermore, the absence of a longitudinal follow-up restricts the understanding of the long-term impact of *H. pylori* infection on psoriasis progression or treatment outcomes and the variability in detection methods for *H. pylori* may have impacted the results, as different diagnostic techniques possess varying sensitivities and specificities. Further studies are recommended with more diverse sample, including rural populations, to improve the generalizability of findings. Additionally, employing multiple diagnostic methods for *H. pylori* detection and exploring the effects of *H. pylori* treatment of psoriasis severity could enhance clinical practice and treatment strategies.

Conclusion

The study found a high frequency of Helicobacter pylori infection (68.4%) among patients with psoriasis, suggesting a possible association between the infection among males, younger individuals, hypertensive patients, and urban residents. Overall, findings highlighting the potential role of H. pylori as a contributing factor in

psoriasis and suggest the need for more in-depth studies to explore its clinical relevance and possible impact on disease management.

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