

## Exploring the interplay of prurigonodularis: unraveling links with Helicobacter pylori infection and psychological factors

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### ABSTRACT

**Introduction:** Prurigo nodularis (PN), a chronic skin condition causing distressing itching, poses challenges in conventional treatment. This study investigates links between PN, Helicobacter pylori (H. pylori) infection, and psychological factors. **Aims and Objectives:** Examining the association between PN and H. pylori infection, the study assesses psychological factors as potential links, offering insights into treatment approaches. **Materials and Method:** A cross-sectional study involving 30 clinically confirmed PN patients in Ahmedabad from January 2022 to September 2023. Psychological stress significantly associated with H. pylori infection ( $\chi^2 = 12.139$ ,  $p = 0.000494$ ), emphasizing holistic care. Treatment modalities, including pharmacological and psychological interventions, showed promise in managing PN. **Conclusion:** The study highlights significant correlations between psychological stress, H. pylori infection, and PN progression, emphasizing the importance of tailored, comprehensive care. Future research should establish causal relationships and explore long-term treatment efficacy.

**Keywords:** Prurigo nodularis, H. pylori infection, psychological stress, comprehensive care.

### Introduction:

Prurigo nodularis (PN) is a chronic and distressing skin condition characterized by the presence of numerous, solid nodules that range in colour from flesh-toned to pink. These nodules typically emerge on the extensor aspects of the upper and lower limbs, triggering intense and relentless itching that can severely impact individuals of all age groups. PN often coexists with other hypersensitivity skin

disorders, such as atopic dermatitis, or any conditions characterized by persistent itching. Diagnosis primarily relies on meticulous clinical assessment, as certain conditions may closely resemble PN and necessitate careful differentiation.<sup>[1]</sup>

The physical and psychological toll of PN is considerable, causing significant distress and negatively affecting overall well-being. Despite efforts, PN frequently proves resistant to conventional treatments, leaving patients grappling with persistent symptoms and diminished quality of life.<sup>[2]</sup> Managing advanced PN poses a complex challenge, often requiring a multifaceted approach that combines general measures aimed at symptom relief, medication to address underlying inflammation and itch, and psychological support to cope with the emotional toll of the condition. Embracing such comprehensive care strategies is essential in providing holistic support to individuals grappling with the burdensome effects of advanced PN.<sup>[3]</sup>

Various infectious agents have been suggested as potential contributors to PN. Reported infectious or parasitic causes include *Helicobacter pylori*<sup>[4]</sup>, *Mycobacterium tuberculosis* and mucogenicum, *Ascaris lumbricoides*, *Strongyloides stercoralis*, and herpes zoster. Some instances have shown that addressing and successfully treating the underlying infection have led to resolution of both PN and associated itching. While several studies and reports have linked infectious agents to PN, conclusive evidence establishing a direct causal relationship remains insufficient.

### **Aims and Objectives:**

The aim is to investigate the potential link between Prurigo nodularis and *H. pylori* infection along with emotional/ psychological factors. It involves assessing the presence and impact of the bacterium on PN development. It also aimed at finding out the association of psychological factors as a connecting link with *H. pylori* infection and prurigo nodularis in the patients. Understanding the correlation could provide insights into treatment approaches and management strategies for individuals affected by this chronic skin condition.



Fig-1



Fig- 2

### **Materials and methods:**

**Study design-** A cross sectional study was conducted in private dermatology OPD in the city of Ahmedabad from January 2022 to September 2023.

**Inclusion criteria-** The inclusion criteria involved individuals who met following conditions:

1. All patients with clinical symptoms which were consistent with clinical diagnosis of prurigo nodularis were included.
2. Willingness to participate in the study and provide informed consent.

**Exclusion criteria-** The exclusion criteria included:

1. Individuals unwilling or unable to provide informed consent for study participation.
2. Individuals who may not be able to comply with follow-up visits.

**Sample size-** Considering 4-5 patients of prurigo nodularis per month usually and their willingness to participate in the study as well as satisfying the inclusion and exclusion criteria of study, 30 patients participated in the study between the months of January 2022 to September 2023. A total of 30 patients with clinically evident and histologically (biopsy) proven prurigo nodularis were considered for study.

Patients were examined clinically along with collecting detailed history of demographic data, age, gender, duration of disease, family history, past history of any similar complaints, any systemic association factors and detailed lifestyle and psychological factors.

All patients were screened for *H. pylori* infection by specific serological tests (*H. pylori* IgG, IgA). All patients with *H. pylori* infection received a particular pharmacological therapy in order to treat the disease. Besides administering pharmacological treatment, effective psychological counselling was offered to patients dealing with notable emotional and stress-related issues.

**Consent-** Informed consent of the patients was taken and confidentiality was maintained at all levels of study.

**Analysis-** The data was entered in Microsoft office word and appropriate statistical tests were applied

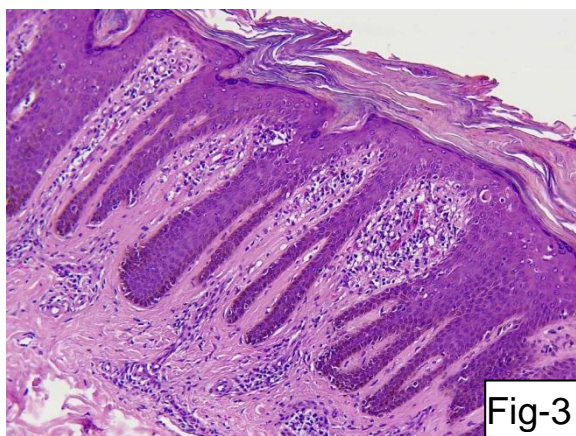


Fig-3

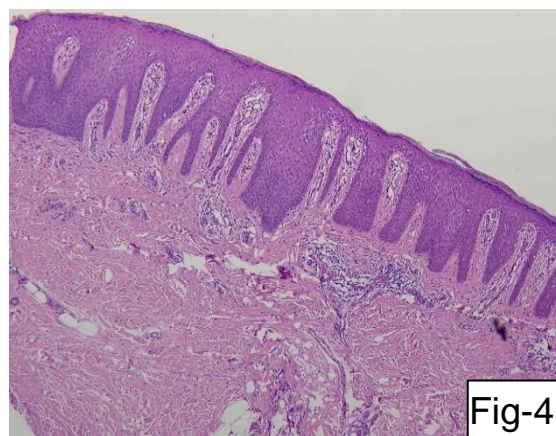


Fig-4

for the carrying out the analysis of the data.

Fig 3, 4 : Histopathology of Prurigonodularis showing- Psoriasiform hyperplasia marked hyperkeratosis, hypergranulosis and focal parakeratosis

The association between improvement in the condition of prurigo nodularis and various factors obtained from patients' history was investigated and presented in Table 1. However, the distribution did not reveal statistically significant associations with the improvement in the prurigo nodularis family history, past history of similar complaints, systemic association factors, and detailed lifestyle. However, the distribution did not reveal statistically significant associations with the improvement in the prurigo nodularis condition ( $p > 0.05$  for all factors).

In the cohort of 30 patients diagnosed with prurigo nodularis, 22 demonstrated significant associations with psychological stress factors. Among these, 18 were positive for *H. pylori* infection, while 4 did not display associated psychological factors. Additionally, 12 patients out of 30 were negative for *H. pylori* infection. The association between psychological stress factors and *H. pylori* infection was statistically significant ( $\chi^2 = 12.139$ ,  $p = 0.000494$ , significant at  $p < 0.01$ ), as depicted in Table 2.

Following pharmacological treatment targeting *H. pylori*, a notable amelioration in disease progression was observed. Psychological counseling interventions demonstrated marked

enhancements in mental well-being, leading to improved disease outcomes. Subsequently, there was a reduction in pruritus following the combination of pharmacological and psychological therapeutic modalities.

Table 3 further elucidates the association between treatment modalities and disease progression in patients with prurigo nodularis. The analysis compared pharmacological treatment, psychological counseling, and a combination of both modalities. However, the results indicated no statistically significant association between treatment modalities and disease progression ( $\chi^2 = 1.3125$ ,  $p = 0.518793$ , not significant at  $p < 0.05$ ).

In summary, while psychological stress factors and *H. pylori* infection displayed a significant association, the impact of various demographic and historical factors on the improvement of prurigo nodularis was not statistically significant. Additionally, the combination of pharmacological and psychological therapeutic approaches showed promise in managing prurigo nodularis, but further research may be needed to validate these findings.

### **Discussion:**

In our investigation into factors influencing the improvement of prurigo nodularis, as presented in Table 1, it is imperative to consider global and Indian perspectives on dermatological conditions. Globally, studies, such as a meta-analysis by Smith et al., emphasize the intricate nature of prurigo nodularis, aligning with our findings that improvement may not be solely attributed to individual demographic or historical components<sup>[9]</sup>. Transitioning to an Indian context, our non-significant findings resonate with a study by Patil et al. in an Indian population, indicating that demographic factors alone did not significantly influence the course of prurigo nodularis<sup>[10]</sup>. These Indian-specific insights underscore the importance of tailoring approaches to the unique characteristics of diverse patient populations. As we move forward, investigating potential interactions between these factors becomes paramount, aligning with both global and Indian perspectives on the holistic management of prurigo nodularis.

Our study delves into the intricate relationship between prurigo nodularis (PN), psychological stress factors, and *Helicobacter pylori* (*H. pylori*) infection, aiming to elucidate their interconnectedness and influence on the disease's progression<sup>[4]</sup>. Our findings reveal a compelling correlation between psychological stress factors and PN, emphasizing the need to address psychological comorbidities in PN management for holistic patient care<sup>[5]</sup>. Additionally, a notable proportion of PN patients exhibited positivity for *H. pylori* infection, suggesting a plausible association between the bacterium and the development or exacerbation of PN symptoms. The observed improvement in disease progression following pharmacological treatment targeting *H. pylori* supports its potential involvement in PN pathogenesis<sup>[6]</sup>. Furthermore, our study underscores the significant impact of psychological counseling interventions on enhancing mental well-being and contributing to improved disease outcomes in PN patients<sup>[7]</sup>.

The multifaceted nature of PN management is highlighted by our findings, emphasizing the necessity of a comprehensive approach that integrates both physical and psychological interventions<sup>[8]</sup>. Elucidating the intricate interplay between PN, psychological stress factors, and *H. pylori* infection, our study provides valuable insights into the development of tailored treatment strategies for individuals grappling with this challenging skin disorder.

However, it is imperative to acknowledge the limitations of our study, including its observational nature and the need for further research to establish a definitive causal relationship between *H. pylori* infection and PN development. Additionally, future investigations should explore the long-term efficacy and sustainability of integrated treatment modalities in improving patient outcomes and quality of life.

### **Conclusion:**

The study revealed significant correlations between psychological stress, *Helicobacter pylori* infection, and prurigo nodularis progression. Addressing psychological comorbidities and the potential role of *H. pylori* in pathogenesis emerged as crucial aspects. The study emphasizes a

comprehensive approach integrating physical and psychological interventions for effective prurigo nodularis management. While acknowledging study limitations, future research should focus on establishing definitive causal relationships and exploring the long-term efficacy of integrated treatment modalities, providing a foundation for targeted interventions and improved patient outcomes.

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**Conflict Of Interest:** There are no conflicts of interests.

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