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Helicobacter pylori seropositivity in psoriasis

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ABSTRACT

Background: Psoriasis is a common inflammatory disease characterized by erythematous papules and plaques with silvery white scales. Recently, the role of H. pylori has been studied as a possible etiological factor. Various published studies conducted to see the association of psoriasis with H. pylori show conflicting results. **Aims and Objective:** The aim of this study was to find out the association of H. pylori infection in patients with psoriasis. **Materials and Methods:** Cross sectional comparative study was conducted in Outpatient Department (OPD) of Dermatology, Bir Hospital. Any patient presenting at dermatology OPD above 16yrs of age with psoriasis were taken as cases. Age and gender matched patients with skin disease other than psoriasis were taken as controls. The test was done by collecting 2ml of venous blood from each patient. The serum was separated by centrifuging the sample. All the patients were screened for Helicobacter pylori infection by using a commercially available immunochromatographic kit for the detection of immunoglobulin G antibody against H. pylori in the serum. **Results:** Chronic plaque psoriasis was the most common variant (72.2%) and there was no significant association between psoriasis type and gender. Male to female ratio was 1.61:1. The mean age of onset in male patients was 42.41years and mean onset of disease in females was 40.61years. Our study showed 21.3% of the psoriasis patients had the history of psoriasis in the family. Nail changes were noted in 40.42% of patients. Psoriatic arthritis was present in 3% of cases. In our study H. pylori infection was found in 25(53.19%) of psoriasis patients and 15(31.91%) of the controls. This showed that H. pylori infection was found higher in psoriasis patients than the controls and the difference was statistically significant ($p = 0.037$). **Conclusion:** This study showed the higher prevalence of H. pylori infection in patients with psoriasis and the differences is statistically significant. It also showed that there is increased prevalence of H. pylori seropositivity with the severity of the disease and with increased duration of illness though it is not statistically significant.

Key words: Helicobacter pylori; Psoriasis area and severity index; Psoriasis; Seropositivity

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INTRODUCTION

Psoriasis is a common, chronic, disfiguring, inflammatory and proliferative condition of the skin in which both genetic and environmental influences have a critical role. The most characteristic lesions consist of red, scaly, sharply demarcated, indurated plaques present particularly over extensor surfaces and scalp.[1]

Worldwide prevalence of psoriasis is found to be 0.1 to 11.8 percent.[2] The data obtained from Department Of Dermatology, Bir Hospital suggests that, in the year 2016-2017AD(2073 BS), a total of 28828 new patients attended the OPD out of which 333 (Male=177,female =156) were diagnosed as having psoriasis, which comprises 1.16% of the total OPD visits.

Various microorganisms are found to be associated for the provocation and exacerbation of psoriasis such as; bacteria (*staphylococcus aureus* and *streptococcus pyogens*), viruses and fungi. One of the newly suggested bacterial aetiology is Helicobacter pylori, which happens to be one of the most common bacterial infections in the world.[3]

H. pylori infections are considerably more common in psoriasis patients than in healthy controls and according to various studies H. pylori is considered to be one of the organisms capable of triggering psoriasis. Several studies

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have reported cases that suggests the role of H. pylori in the severity of psoriasis and its eradication increases the efficacy of treatment of the disease.[4]

There are no published studies in our country till date to assess the correlation of psoriasis with H. pylori infection. This study is being proposed to find out the prevalence of H. pylori infections in patients with psoriasis and also to see if there is any association between them. If association between H. pylori and psoriasis is found, routine screening for H. pylori infection can be advised to psoriasis patients and will benefit from eradication of H. pylori infection.

MATERIALS AND METHODS

Following the ethical clearance from the Institutional Review Board (IRB) of National Academy of Medical Sciences (NAMS), a comparative cross sectional study was conducted at Bir Hospital, Kathmandu, Nepal. The patients presenting to the Dermatology OPD and diagnosed as psoriasis and fulfilling the inclusion criteria were enrolled in the study as a case. On the basis of history and clinical examination psoriasis was diagnosed by the dermatologist. Age and sex matched patients with skin disease other than psoriasis were enrolled as controls. Patients suffering from other dermatological disease which has association with H. pylori infection like chronic urticaria, rosacea was excluded from the study.

Informed written consent was taken in either Nepali or English language whichever they felt comfortable assuring full confidentiality.

The researcher filled up a detailed proforma of the patient. Psoriasis Area Severity Index (PASI) which is done to access the severity of the disease in plaque psoriasis was calculated as presented in the proforma in all patients except guttate psoriasis and palmoplanter psoriasis.

BSA was calculated according to the Wallace rule of nine for all the cases except guttate psoriasis.

All the patients were screened for Helicobacter pylori infection by using a commercially available immunochromatographic kit for the detection of immunoglobulin G antibody against H. pylori in the serum.

Name of test: rapid test for detection of antibodies to H. pylori in human serum with kit Clungene, manufactured by Hangzhou Clongene biotech Co. Ltd, China was used. It is a rapid self-performing immunoassay for the detection of antibodies to H. pylori in human serum. It is based on the principle of immunochromatography. The test device consists of a membrane which is precoated with H. pylori specific antigens on test band regions. If antibody to H. pylori (IgG) is present on the sample in concentration above the labeled, it forms complex with the conjugate. This conjugate moves on membrane by capillary action and gets immobilized by recombinant H. pylori antigen on the test region leading to formation of pink/purple colored band.

The test was done by collecting 2ml of venous blood from each patient in a sterile syringe without anticoagulant which was kept in a test tube and allowed to clot for 30 minutes at room temperature. The serum was separated by centrifuging the sample at 450 to 500g for 10 minutes where g is relative centrifugal force at Dermatology OPD. When the serum was ready, the test strip in the kit was removed from the sealed pouch by tearing along the notch and labeled with patient's identity. With the help of sample dispensing dropper 2 drops of serum was placed on the sample pot. Test result was read after 15 minutes.

All patients with psoriasis were managed in the department of Dermatology with regular follow up and patients with positive results with H. pylori was referred to the department of Gastroenterology, Bir hospital for further confirmation and management of H. pylori infection.

The collected data was stored in an electronic database (MS-Excel Sheet). Statistical analyses were performed with statistical software (SPSS 22.0 for Windows).

Results were analyzed using appropriate statistical methods. All the meaningful statistics was worked out. Chi-square (χ^2) test was used when appropriate.

P-value was calculated under the predetermined level of significance (0.05) and Confidence Interval (CI) of 95% was constructed. Results was expressed as percentages, mean +/- standard deviation and median for variables

RESULTS

Forty-seven patients diagnosed with psoriasis were included as cases and same number of age and sex matched non-psoriatic patients with skin diseases which has no association with H. pylori were selected as controls. Out of 47 psoriatic patients, 29 patients (61.70%) were males and 18 patients (38.3%) were females. The male to female ratio was 1.61:1.Age of the patients ranged from 17 to 75 years. Maximum number of cases was found in age group 16-25 years and 46-55 years. Minimum number of cases was found in greater than 65 years of age as shown in Table 1.

Out of the total 47 cases, there were no any identifiable precipitating factors in 72.3% while precipitating factors

were present in only 27.7%. Among the precipitating factors, most frequent association was seen with smoking (14.9%) followed by stress (4.3%) and trauma (4.3%).

Nail involvement was seen in 40.4% of cases. Hypertension was present in 6.38% while diabetes mellitus and chronic obstructive pulmonary disease was found in 2.12% of the psoriasis patients. Chronic plaque psoriasis was the most common type (76.6%) followed by guttate (10.63%), palmoplanter (8.51), erythrodermic (4.3%)

Patients with PASI score less than 10 were classified as mild psoriasis, 11-20 as moderate and more than 20 as severe psoriasis. In our study, 86.8% had mild psoriasis, 10.5% had moderate and only 2.6% had severe psoriasis. The mean PASI was found to be higher in males (6.99) than in females (4.65) Joint involvement was seen in only 2.12% of our cases.

Out of 47 cases 25(53.19%) were positive for H. pylori IgG and among controls 15 (31.91%) were positive for H. pylori IgG. H. pylori infection was seen to be higher in psoriasis patients than in controls and is statistically significant (P=0.037) as shown in Table 2.

Assessment of H. pylori seropositivity with PASI

Among the cases we included chronic plaque psoriasis and erythrodermic psoriasis as PASI score is used to assess severity of illness in plaque psoriasis so the total number of cases were thirty-eight. While comparing PASI score with H. pylori seropositivity, 100% of patients with severe psoriasis and 75% of patients with moderate psoriasis had positive H. pylori IgGAb. In patients with mild psoriasis H. pylori IgGAb was positive in only 42.42%. Though the findings show greater prevalence of H. pylori seropositivity with the severity of illness it is not found to be statistically significant (P = 0.265) as shown in Table 3.

Table 1: Age and gender distribution among cases and controls

Age (Years)	Cases (N)		Control (N)		Total (N)
	Male	Female	Male	Female	
16-25	6	4	6	4	20
26-35	5	2	5	2	14
36-45	5	4	5	4	18
46-55	5	5	5	5	20
56-65	6	3	6	3	18
>65	2	0	2	0	4
Total	29	18	29	18	94

Table 2: Comparison of H. pylori IgG in cases and controls

Study group	H. pylori IgG			P value
	Positive n(%)	Negative n(%)	Total n(%)	
Case	25(53.19)	22(46.81)	47(100)	0.037
Control	15(31.91)	32(68.09)	47(100)	
Total	40(42.55)	54(57.45)	94(100)	

Assessment of H. pylori seropositivity with body surface area

The total number of patients included was forty two as we cannot measure BSA in guttate psoriasis. Assessment of H. pylori seropositivity with Body Surface Area revealed that H. pylori IgGAb was positive in 100% of patients with involvement of BSA>80% and it was positive in 66.67% of patients with BSA 20-40% involvement. With BSA <20%, H. pylori IgGAb was positive in only 41.94% of the cases. There were no cases with the BSA involvement of 41-80%. This finding suggests that H. pylori infection is more prevalent in patients with severe disease in respect to BSA however it is not statistically significant (p=0.149) as shown in table 4.

DISCUSSION

The role of infection in causing psoriasis has been repeatedly raised over the years but there is no conclusive evidence. Recently the role of helicobacter pylori has been studied as possible etiological factor. What makes the research interesting is the chronic, endemic and asymptomatic nature of H. pylori infection.

In our study out of the total 47 psoriasis patients, H. pylori were positive in 25 cases. Among them 18(72%) were males and 7(28%) were females which showed H. pylori infection to be more common in males as compared to females. Maximum positive cases in males were present in the age group 36-45 years while in females it was observed in age group 46-55 years as well as in patients greater than 65 years. According to Qayoom et al., H. pylori was positive in 40% of psoriasis patients where 56% were male and 44% were females.[5] Although there is no evidence that

Table 3: PASI score and H. pylori IgG antibody

PASI	H. pylori IgG antibody			P value
	Positive	Negative	Total	
<10	14(42.42)	19(57.58)	33(100)	0.265
10-20	3(75)	1(25)	4(100)	
21-30	1(100)	0(0)	1(100)	

Table 4: Body surface area and H. pylori IgG antibody

BSA (%)	H. pylori IgG antibody			P value
	Positive	Negative	Total	
< 20	13(41.94)	18(58.06)	31(100)	0.149
20-40	6(66.67)	3(33.33)	9(100)	
>80	2(100)	0(0)	2(100)	

psoriasis is phenotypically different between males and females, various studies do suggest an earlier age of onset in females which may be due to hormonal influences.

Genetic factors do play an important role in the etiopathogenesis of psoriasis.[6] It has been estimated that the risk of psoriasis in offspring is about 41%, if both of the parents are affected, 14% if one of the parent is affected and 6% if sibling is affected compared to 2% if no one is affected.[1] In our study 21.3% of the patients had the history of psoriasis in the family. In a study done by Bolognia et al., positive family history was present in 40.7%.[7] Bedi et al., reported family history in 14% of the patients.[8]

Seasonal variation of psoriasis is reported in several studies. According to Kaur et al., winter exacerbation was present in 42% of patients while disease worsened in summer season in only 8%.[9] which was very similar to our study where we found winter exacerbation in 40.42% and summer exacerbation in 8.51%. However 36.17% of patients had no seasonal variation in our study. Most of the studies have reported winter exacerbation of psoriasis and it may be due to cold temperature and low humidity in winter which can increase skin permeability, epidermal thickening and stimulate inflammatory mediator production.

Many studies have demonstrated that individuals with psoriasis have a higher prevalence of obesity, diabetes and hypertension.[10] In our study we found hypertension in 6.38% of patients while DM was present in 2.12% and both were present in 2.12%. In contrast, Qureshi et al., found that psoriasis is associated with hypertension in 20% of cases while the incidence of DM was 2% that was similar to our study.[11] So patients with psoriasis should be advised for regular monitoring of blood pressure, blood sugar level and cardiovascular screening.

Various studies have been done to find out the association of H. pylori infection with psoriasis. In our study H. pylori infection was found in 25(53.19%) of psoriasis patients and 15(31.91%) of the controls. This showed that H. pylori infection was found higher in psoriasis patients than the controls and the difference is statistically significant (p=0.037). A study done by Zhelezova et al., detected H. pylori antibody in 16(64%) of psoriatic patients and 8(33.3%)of control groups (p=0.04).[12] However another study done by Türkmen et al., showed that H. pylori was positive in equal numbers in both cases and controls.[13]

While comparing H. pylori IgG positivity in relation to the duration of the disease, H. pylori was positive in 100% of patients with disease duration of 16-20 years and 75% positive with disease duration of greater than 20 years. It was positive in 38.46% of patients with duration of illness for 0-5years. Though this data signifies that H. pylori seropositivity is influenced by the duration of the disease, it is not found to be statistically significant (p=0.140). Similar to our result Azizzadeh et al., also showed the higher prevalence of H. pylori infection in patients with increased duration of illness.[14]

While comparing PASI score with Helicobacter pylori seropositivity, 100% of patients with severe psoriasis and 75% of patients with moderate psoriasis had positive H. pylori IgGAb. In patients with mild psoriasis H. pylori IgGAb was positive in only 42.42%, which shows greater prevalence of H. pylori seropositivity with the severity of illness with respect to PASI however the findings are not statistically significant (p=0.265). Similarly Campanati et al.,[15] and Fathy et al.,[16] established that higher values of seropositivity correlated with severe psoriasis and hypothesized that H. pylori could be at least the provoking factor behind psoriasis. Study also reported, those patients who received successful eradication of H. pylori infection shows greater improvement of psoriasis than the others.[17]

While comparing the variants of psoriasis with H. pylori infection our study showed that 100% of the erythrodermic patients were positive for H. pylori IgG. Similarly 80% of patients with guttate psoriasis and 75% of patients with palmoplantar psoriasis were positive for H. pylori IgG. Only 44.44% of patients with chronic plaque psoriasis had positive H. pylori seropositivity. However this finding was not statistically significant (p=0.166).

Evaluation of the association of Body Surface Area (BSA) with Helicobacter pylori seropositivity revealed that H. pylori IgGAb was positive in 100% of patients when the BSA was greater than 80% and it was positive in 66.67% of patients with BSA of 20-40% involvement. H. pylori IgGAb was positive in only 41.94% of the cases with the involvement of less than 20% BSA. These findings suggest that H. pylori infection is more prevalent in patients with severe disease with respect to BSA however it is not statistically significant (p=0.149).

LIMITATIONS OF THE STUDY

The limitations of this study were the sample size was small in comparison to another similar studies, data was collected only from one hospital, short duration of study so it was difficult to follow up the patients.

CONCLUSION

There is a higher prevalence of H. pylori infection in patients with psoriasis and is statistically significant

(p=0.037). Our study also showed the greater prevalence of H. pylori infection in patients with severe psoriasis and in patients with increased duration of illness however it is not statistically significant. However, as it is a hospital based study with small sample size the results cannot be generalized.

Though the etiology of psoriasis seems multifactorial but H. pylori may trigger for the development of disease and may interfere with the severity of psoriasis in susceptible individuals. Larger multicentric studies and eradication of H. pylori in psoriatic patients with positive serology are necessary for definitive confirmation.

Screening for H. pylori infection may be advised especially in patients with severe psoriasis with respect to high PASI score or BSA and in patients with increased duration of illness.

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Author's contribution
PP-Concept and design of the study, manuscript preparation, data collection, statistically analyzed and interpreted; **BMMK-** Reviewed the literature, critical revision of manuscript, helped in preparing first draft of manuscript; **AK-** Reviewed the literature, critical revision of manuscript, helped in preparing first draft of manuscript.

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