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Original Research Article

Frequency of Hyperuricemia in Patients with Psoriasis

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Abstract: *Psoriasis is a chronic inflammatory skin disorder associated with systemic comorbidities, including metabolic syndrome and cardiovascular diseases. Hyperuricemia, characterized by elevated serum uric acid levels, has been implicated in systemic inflammation and metabolic dysfunction. However, its prevalence and association with psoriasis remain underexplored.* ***Objective:*** *To determine the frequency of hyperuricemia in patients with psoriasis.* ***Methodology:*** *A descriptive cross-sectional study was conducted at Khyber Teaching Hospital, Peshawar for six months from 22 June 2022 to 22 December 2022. One hundred twenty-one psoriasis patients, aged 12 to 70 years, were selected through a consecutive non-probability sampling method. Individuals with pulmonary disorders, chronic kidney disease, or those receiving medications that reduce uric acid levels were excluded from the study. The frequency of hyperuricemia was assessed in all patients.* ***Results:*** *The study found that 21.5% of psoriasis patients had hyperuricemia. The mean age of participants was 40.31 ± 12.82 years, and the mean disease duration was 5.82 ± 2.59 years. There was a significant association between disease duration and hyperuricemia ($p = 0.044$). However, no significant correlations were found between hyperuricemia and age, gender, or BMI ($p > 0.05$).* ***Conclusion:*** *The study concluded that hyperuricemia is prevalent among psoriasis patients, particularly those with a longer disease duration. Routine screening for hyperuricemia in psoriatic patients is recommended to prevent associated comorbidities, such as cardiovascular disease and metabolic syndrome.*

Keywords: Psoriasis, Hyperuricemia, Uric acid, Disease duration, Frequency, Cross-sectional study, Khyber Teaching Hospital, Risk factors

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Introduction

Psoriasis is a long-lasting condition projected to affect around 1.7% of the population in Canada. In addition to the physical aspects of the condition, psoriasis significantly impacts patients' emotional and psychosocial well-being. It can lead to stigmatisation, diminished self-esteem, and increased stress, which in turn affects social interactions and personal relationships (1, 2). Psoriasis is an inflammatory disease affecting multiple systems, primarily skin and joints. The condition demonstrates a bimodal developmental onset at 2 years, impacting both genders with equal prevalence (3). The development of the disease is affected by multiple factors, including improper inflammation responses and genetic links (4). Psoriasis may manifest at any age. A bimodal age range for onset has been identified. The average age at which individuals first present with psoriasis typically falls between 15 and 20 years, with an increase afterwards between 55 and 60 (5,6). The underlying mechanisms of psoriasis include the infiltration of the skin through activated T cells, which in turn encourage the proliferation of keratinocytes. The dysregulation of keratinocyte turnover leads to thick plaques (7). In addition to being a skin condition, psoriasis has been linked with various behavioural and systemic comorbidities, including metabolic syndrome, and significantly affects quality of life. Hyperuricemia constitutes one of the elements of metabolic syndrome. Uric acid serves as a naturally existing final product resulting from the metabolism of purines. Various studies have demonstrated a significant correlation between elevated serum uric acid levels, insulin resistance, and metabolic syndrome, which is believed to arise due to insulin resistance (8,9). A study has identified a correlation between psoriasis and hyperuricemia (10). In a study, asymptomatic hyperuricemia was higher in psoriasis than controls (19% and 7%) (11).

In Pakistan, psoriasis is a significant health issue. Similarly, the incidence of psoriasis and hyperuricemia is on the rise. Hyperuricemia can be detected early and treated to prevent psoriasis consequences such as psoriatic arthritis, cardiovascular disease, and metabolic syndrome. The prevalence of hyperuricemia in psoriasis has not yet been studied locally. This study will serve as a foundation for future research in this field.

Methodology

Following the synopsis's approval, a descriptive cross-sectional study was conducted at the dermatology unit of Khyber Teaching Hospital Peshawar from 22 June 2022 to 22 December 2022. Peshawar. The sample size was 121 patients with psoriasis, based on a 19% prevalence of hyperuricemia in psoriasis[11], using a 95% confidence interval and a 7% margin of error, according to the WHO online calculator for sample size determination. Consecutive non-probability sampling was employed to select the participants.

The study's inclusion criteria comprised patients diagnosed with psoriasis through clinical history and examination, aged 12 to 70. Individuals with pulmonary disorders, including COPD, asthma, interstitial lung disease, and bronchiectasis, along with those receiving medications that reduce uric acid or suffering from chronic kidney disease (CKD), were excluded from the study.

Data collection involved obtaining written informed consent from all participants, followed by a comprehensive physical, systemic, and dermatological examination. A phlebotomist collected 2 mL of venous blood from each patient, which was sent to the hospital laboratory for serum uric acid measurement. Demographic data, including height, weight, and relevant clinical details, were recorded on a proforma.

The analysis was performed utilizing SPSS version 22.0. Continuous variables were assessed through mean and standard deviation analysis, including age, disease duration, and BMI. The analysis of categorical variables, such as gender and hyperuricemia status, was conducted using frequencies and percentages. The frequency of hyperuricemia was

stratified according to age, gender, disease duration, and BMI to account for potential effect modifiers using the Chi-square test keeping p-value significant at 0.05. Results were displayed through tables and figures.

Results

The study involved 121 patients, with a mean age of 40.31 ± 12.82 years. The average Body Mass Index (BMI) was 24.94 ± 2.37 kg/m², and the disease duration was 5.82 ± 2.59 years. The mean uric acid level was 6.22 ± 1.64 mg/dl.

Regarding gender distribution, 53.7% of the patients were male, while 46.3% were female. Regarding hyperuricemia prevalence, 21.5% of the participants had elevated uric acid levels, while 78.5% did not.

When stratifying the data by age, the highest frequency of hyperuricemia was observed in individuals aged 31 to 50, with 65.4% of those affected. In contrast, 7.7% of participants aged 12 to 30 had hyperuricemia, while 26.9% of those aged 51 to 70 exhibited elevated uric acid levels. The difference in age distribution between individuals with and without hyperuricemia was not statistically significant (p = 0.20).

The gender distribution among those with hyperuricemia showed that 61.5% were male, and 38.5% were female (p = 0.367).

For the duration of the disease, 61.5% of patients with hyperuricemia had been suffering from the condition for 1 to 8 years, while the majority did not have hyperuricemia (98.9%). 38.5% had a disease duration of 9 to 15 years, and only one patient in this age group did not develop hyperuricemia (p = 0.0001), indicating that a longer duration of psoriasis may be linked to higher uric acid levels.

Finally, regarding BMI, those with a BMI between 18 and 24.9 kg/m² accounted for 53.8% of hyperuricemic patients, while those with a BMI greater than 24.9 kg/m² represented 46.2% (p = 0.712).

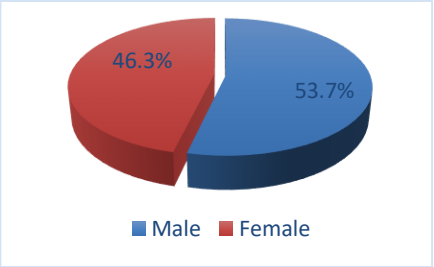

Figure 1 Gender distribution

Table 1 Descriptive statistics

Parameters	N	Mean	Std. Deviation
Age (Years)	121	40.31	12.82
BMI (Kg/m2)	121	24.9400	2.36646
Duration of disease (Years)	121	5.82	2.59
Uric acid level (mg/dl)	121	6.4876	2.32420

Table 2 Frequency of hyperuricemia

Hyperuricemia	Frequency	Percent
Yes	26	21.5
No	95	78.5
Total	121	100.0

Table 3 Stratification of hyperuricemia with age, gender, duration of disease and BMI

Parameters		Hyperuricemia				P value
		Yes		No		
		N	%	N	%	
Age distribution (Years)	12 to 30	2	7.7%	20	21.1%	0.20
	31 to 50	17	61.5%	59	62.1%	
	51 to 70	7	26.9%	16	16.8%	
Gender	Male	16	61.5%	49	51.6%	0.36
	Female	10	38.5%	46	48.4%	
Duration of disease (Years)	1 to 8	16	61.55	84	98.9%	0.001
	9 to 15	10	38.5%	1	1.1%	
BMI (Kg/m^2)	18 to 24.9	14	53.8%	55	57.9%	0.71
	> 24.9	12	46.2%	40	42.1%	

Discussion

The study's age distribution indicated a mean age of 40.31 ± 12.82 years, with the peak incidence of hyperuricemia observed in participants aged 31 to 50 years. This finding aligns with earlier research, including that of Gisondi et al., which reported a mean age of approximately 54.1 years among psoriatic patients, with a higher prevalence of hyperuricemia in the middle-aged population. Nevertheless, the research conducted by Gisondi and colleagues did not delineate the specific age range most impacted by hyperuricemia (11). The research conducted by Rizwan et al. indicated a mean age of 39.47 ± 13.92 years, which closely corresponds with the current study's findings, implying a comparable age distribution among psoriasis patients in various regions (12). The study observed that mean uric acid levels increased with age, suggesting a potential association between older age and more severe psoriasis cases. Specifically, individuals aged 31 to 50 years exhibited a higher likelihood of hyperuricemia. This age range likely indicates patients with a prolonged history of psoriasis, which may lead to associated comorbidities such as hyperuricemia.

This study reveals both similarities and differences in gender distribution when compared to previous research. The study found that males constituted 53.7% of the participants, whereas females accounted for 46.3%. The findings align closely with those of Gisondi et al., which reported a gender distribution skewed toward males, comprising 72.6% of hyperuricemic patients (11). The study by Rizwan et al., emphasizes this gender difference, reporting a male to female ratio of 1.3:1, with males constituting 56.5% of the psoriatic sample (12).

The frequency of hyperuricemia in our study was 21.5%, which is slightly lower than the 25.8% observed in the study by Rizwan ET al. (12). In Gisondi et al.'s study, the prevalence of hyperuricemia was reported to be 19% in psoriatic patients, which is consistent with the lower prevalence observed in the present study (11). This discrepancy in the frequency of hyperuricemia may be attributed to differences in the geographic regions of the studies and patient selection criteria. The current study involved patients with a relatively short duration of psoriasis, averaging around 5.82 ± 2.59 years. A study has shown that hyperuricemia is more likely to occur in individuals with a longer duration of psoriasis, especially when the disease progresses to psoriatic arthritis (13). Rizwan et al., reported a significant relationship between serum uric acid levels and the severity and duration of psoriasis (13). This may explain why their study found a higher frequency of hyperuricemia than the current study, which focused

on a sample of patients with psoriasis but did not necessarily include those with psoriatic arthritis or more severe cases.

The study's results suggest a notable association between the duration of psoriasis and hyperuricemia. Patients with a disease duration of 9 to 15 years had a higher frequency of hyperuricemia, 38.5%, and only one patient in this age group did not develop hyperuricemia. This finding is supported by the literature, including that of Gisondi et al., which showed that longer durations of psoriasis are associated with a higher prevalence of hyperuricemia (11). Furthermore, the study by Yehia et al., noted that the increased serum uric acid levels in psoriatic patients might be due to metabolic changes associated with chronic inflammation, which becomes more pronounced as the disease persists. While the notable significance observed in this study ($p = 0.0001$) highlights the potential impact of disease duration on the occurrence of hyperuricemia, it is important to note that further studies are needed to explore the underlying mechanisms linking disease duration with elevated uric acid levels.

Conclusion

This study reveals a 21.5% frequency of hyperuricemia among psoriatic patients, indicating a strong association between hyperuricemia and extended disease duration. The duration of psoriasis influenced the occurrence of hyperuricemia, despite the absence of strong correlations with age, gender, or BMI. The findings highlight the necessity of regularly monitoring uric acid levels in patients with psoriasis, especially as the disease progresses, to manage related comorbidities effectively.

Declarations

Data Availability statement
All data generated or analysed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (IRBEC-MTI-022-22)
Consent for publication
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Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

MZH (PGR)
Manuscript drafting, Study Design, Data entry, Data analysis, and drafting article, Conception of Study, Development of Research Methodology Design
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Review of Literature, Critical Input
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All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the integrity of the study.

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