

Prevalence of migraine headache in patients with psoriasis vulgaris referred to dermatologists in Semnan, Iran: a cross-sectional study

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Background: Psoriasis is a chronic and recurrent inflammatory skin disease. In some recent studies, the association between this disease and migraine headaches has been indicated. The present study aimed to determine the frequency of migraine headache in patients with psoriasis vulgaris.

Methods: In this cross-sectional study, 72 patients with psoriasis vulgaris referred to dermatologists in Semnan from April 2018 to September 2018 were included using the complete enumeration method. After the confirmation of migraine headache by a neurologist, the migraine severity and clinical features were assessed. Data were collected and analyzed by SPSS 16 software.

Results: Among 72 patients with psoriasis vulgaris, 15 (20.8%) had a migraine. In patients with migraine headache compared to others, the mean and standard deviation of the visual analog scale-based headache severity (8.33 ± 1.05 vs. 4.11 ± 2.30 , $P < 0.001$), MIDAS-based headache severity (13.85 ± 2.48 vs. 4.98 ± 2.11 , $P = 0.004$), and PASI score-based psoriasis severity (22.55 ± 7.08 vs. 5.38 ± 2.95 , $P = 0.001$) were significantly higher.

Conclusion: The prevalence of migraine headaches is significantly higher in patients with psoriasis vulgaris, and patients with severe psoriasis are more likely to suffer from migraine headaches. We recommend screening for migraine headaches in patients with psoriasis, especially when the relevant risk factors are evident. High-risk patients should be given further consideration, facilitating the achievement of better management and higher patient satisfaction.

Keywords: psoriasis vulgaris, migraine, dermatology clinic, headache

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INTRODUCTION

Psoriasis is a chronic and recurrent inflammatory skin condition, classified as a papulosquamous disease. Since psoriasis involves an increase in epidermal cell turnover, it is also classified in the group of hyperproliferative diseases ¹⁻³. Psoriasis is one of the autoimmune and inflammatory diseases for which the specific cause is yet to be clarified.

However, the role of immune mechanisms, primarily type 1 and with less extent type 2 helper T cells, has been analyzed and verified in the pathogenesis of this disease ^{2,4}. Nevertheless, psoriasis is imagined to be a multifactorial condition that develops due to various genetic, immunological, and environmental factors ⁵. Furthermore, other factors such as familial patterns and association with specific human leukocyte antigens (HLAs) like HLA-CW6 have

been involved in the pathogenesis of this disease ⁶.

Migraine is one of the most severe disorders, presenting as consecutive mild or severe headaches, often associated with symptoms in the autonomic nervous system ^{7,8}. Nearly 1 to 2% of the general population and 15 to 20% of patients referring to the headache centers have migraine, and its prevalence in women is 3-4 times more than men ⁸. Some studies have also reported that the prevalence of migraine headaches in the community is more than 12% ⁹⁻¹².

In some recent studies, a significant relationship between psoriasis and migraine headaches has been indicated ¹³⁻¹⁵. In a cohort study provided by Egeberg *et al.* in Denmark, they reported that patients with psoriasis have a higher chance of suffering from migraines as the disease progressed ¹³. Some researchers expressed that psoriasis-dependent pro-inflammatory cytokines and their effects on vasospasm, inflammation of the meninges, and increased sensitivity to the pain transduction pathways are the factors responsible for the increased prevalence of migraine headaches in psoriasis patients ¹³. Furthermore, patients with psoriasis, similar to those with migraine headaches, have a higher chance of having comorbidities such as cardiovascular disorders, especially stroke, suggesting a possible common mechanism in these two diseases ¹⁵.

Taking into account the high prevalence of psoriasis and migraine headaches, the limited studies provided in this field, and the possible relationship between the two entities, we aimed to determine the frequency of migraine headaches in patients with psoriasis vulgaris referred to dermatologists in Semnan, Iran, in 2018.

PARTICIPANTS AND METHODS

This was a cross-sectional study. The study population consisted of all patients with psoriasis referred to dermatology clinics and two offices of dermatologists in Semnan from April 2018 to September 2018. After explaining the study process and objective to the participants, informed consent was obtained from all patients.

Participants who met the inclusion criteria were patients with psoriasis vulgaris diagnosed by a dermatologist based on the clinical examination, who provided consent to participate in the study,

were above 18 years of age, and had no other skin diseases at the same time. The exclusion criteria were as follows: consuming neurological medicines (e.g., sedatives and tricyclic antidepressants), alcohol consumption, smoking, addiction, having a systemic disease (hypertension, diabetes, and heart disease), and people with neurological problems such as seizure or congenital problems of neural development.

Patients with psoriasis who were referred to dermatology clinics for periodic examinations were evaluated for migraine disease. Migraine was diagnosed according to the opinion of a neurologist considering the clinical symptoms (unilateral and throbbing headache, generally lasting from 2-3 hours to 2-3 days). When indicated, for rejecting other causes of headache, paraclinical analyses including neuroimaging and an electroencephalogram were requested.

The data collection tools included a researcher-made checklist consisting of the Psoriasis Area Severity Index (PASI), Migraine Disability Assessment (MIDAS) standard questionnaire, and clinical manifestations. Individuals who complained of headaches and their headache intervals were less than three months were considered as those suspected of migraine headaches.

The severity of psoriasis was determined using the PASI index ¹⁶. The MIDAS questionnaire was completed after confirming migraine disease in the patients. This questionnaire is a valid and standard scale approved by the International Headache Association to measure the disability caused by migraines. The MIDAS consists of five general questions representing the status of disorders caused by migraine headaches in the past three months. The answer to each question is based on the number of days, and the score obtained from the sum of these five questions divides the patients into four groups based on the performance loss rate: very low or insignificant performance loss (scores from 0 to 5; Grade I), mild to low performance loss (6 to 10; Grade II), medium performance loss (11 to 20; Grade III), and severe performance loss (21; Grade IV).

Also, the migraine clinical manifestations, including duration of attacks, headache severity, migraine type, involvement side of migraine, headache incidence time, symptoms associated with migraine, stimulants, the mitigating reasons

of headaches, and the type of consumed analgesics were recorded. The patients were referred to a neurologist's clinic if migraines were suspected.

Afterward, questionnaires were collected, and the obtained data were entered into SPSS 16 software and analyzed.

Ethical considerations

Ethical approval was obtained from the relevant university (Code: IR-SEMUMS.REC.1397.168). The information was collected confidentially and kept by the researchers. All participants entered the study with written informed consent and full knowledge of the study process and had the right to withdraw at any time. No cost or damage was imposed on the participants

RESULTS

In this study, among 72 patients with psoriasis vulgaris, 15 (20.8%) had migraine headaches, but 57 (79.2%) did not have this disorder. Among 15 patients with migraine, 9 (60.0%) had migraine with auras, and 6 (40.0%) had migraine without auras. About the type of involvement, five patients (33.3%) had right-sided headaches, two patients (13.4%) had left-sided headaches, and eight patients (53.3%) had headaches on both sides. The mean and standard deviation of the visual analog scale (VAS) were generally 4.99 and 2.72, respectively. The mean and standard deviation of VAS were

8.33 ± 1.05 in patients with migraine and 4.11 ± 2.30 in patients without migraine, respectively. The data analysis with the help of the chi-squared statistic represented a statistically significant relationship between two groups with and without migraine headaches in terms of mean headache severity (based on the VAS) ($P = 0.001$). In Table 1, the time distribution of headache incidence is presented in participants of this study according to migraine status. The data analysis with the help of the chi-squared statistic revealed the lack of any significant relationship between the groups with and without migraine headaches in terms of the time of headache incidence ($P = 0.159$) (Table 1).

In Table 2, the distribution of symptoms associated with headaches in the participants of this study is given according to the migraine status. The results of data analysis showed no significant relationship between the groups ($P = 0.167$).

In Table 3, the distribution of headache stimulants according to the migraine status is presented. Again, the data analysis (chi-squared test) showed no significant relationship between the groups with and without migraines in terms of stimulants ($P = 0.723$).

In Table 4, the distribution of the mitigating reasons for headaches in the participants of this study is presented. According to the chi-squared analysis, no significant relationship existed between the with and without migraines groups in terms of the mitigating reasons ($P = 0.906$).

In Table 5, the distribution of the type of

Table 1. Timing of headaches in psoriasis vulgaris patients according to migraine status

Time of headache incidence	With migraine		Without migraine	
	Frequency	Percentage	Frequency	Percentage
Morning	10	66.7	30	52.6
Afternoon	-	-	1	1.8
Evening	1	6.7	8	14.0
Night	4	26.7	6	10.5
No specific time	-	-	12	21.1
Total	15	100	57	100

Table 2. Symptoms accompanying headaches in psoriasis vulgaris patients according to migraine status

Symptoms accompanying headaches	With migraine		Without migraine	
	Frequency	Percentage	Frequency	Percentage
Dizziness	8	53.3	22	38.6
Visual impairment	3	20.0	15	26.3
Photophobia	1	6.7	16	28.1
Other	3	20.0	4	7.1
Total	15	100	57	100

Table 3. Distribution of headache stimulants in psoriasis vulgaris patients according to migraine status

Headache stimulants	With migraine		Without migraine	
	Frequency	Percentage	Frequency	Percentage
Sleep disorder	5	33.3	14	24.6
Fatigue	3	20.0	23	40.4
Hunger	1	6.7	4	7.0
Warmth	-	-	1	1.8
Food	-	-	1	1.8
Light	4	26.7	11	19.3
Aromas	2	13.3	3	5.3
Total	15	100	57	100

Table 4. Distribution of factors mitigating headaches in psoriasis vulgaris patients according to migraine status

Mitigating factors	With migraine		Without migraine	
	Frequency	Percentage	Frequency	Percentage
Sleep	3	20.0	13	22.8
Getting away from sound and light	5	33.3	16	28.1
Rest	5	33.3	23	40.4
Palliative	2	13.3	5	8.8
Total	15	100	57	100

Table 5. Distribution of analgesic types in psoriasis vulgaris patients according to migraine status

Mitigating reasons of headache	With migraine		Without migraine	
	Frequency	Percentage	Frequency	Percentage
Ibuprofen	11	73.3	39	68.4
Acetaminophen	2	13.3	8	14.0
Aspirin	-	-	3	5.3
Injected analgesics	2	13.3	7	12.3
Total	15	100	57	100

consumed analgesics is provided according to the migraine status. The results of data analysis with the help of the chi-squared statistic revealed no significant relationship between the groups ($P = 0.881$).

The mean and standard deviation of headache severity was generally 6.83 ± 4.23 based on the MIDAS questionnaire. This value was at 13.85 ± 2.48 in patients with migraines and 4.98 ± 2.11 in patients without migraines. According to the chi-squared analysis, a statistically significant relationship existed between the groups in headache severity

based on the MIDAS questionnaire ($P = 0.004$). In Table 6, the distribution of performance loss rate during headaches according to the migraine status is presented. The results of data analysis with the help of the chi-squared statistic represented a statistically significant difference between the groups with and without migraines in terms of performance loss rate during headaches ($P = 0.001$).

The mean and standard deviation of psoriasis severity was generally 8.95 ± 8.13 based on the PASI score. This figure was at 22.55 ± 7.08 in patients with migraines and 5.38 ± 2.95 in patients without

Table 6. Distribution of performance loss grades during headaches in psoriasis vulgaris patients according to migraine status

Performance loss during headache	With migraine		Without migraine	
	Frequency	Percentage	Frequency	Percentage
Grade I	-	-	33	57.9
Grade II	-	-	16	28.1
Grade III	14	93.3	8	14.0
Grade IV	1	6.7	-	-
Total	15	100	57	100

migraines. The chi-squared analysis revealed a significant difference between the groups with and without migraines regarding psoriasis severity based on the PASI score ($P = 0.001$).

DISCUSSION

Migraine is a significant risk factor for cardiovascular diseases and can double the risk of coronary diseases, leading to severe complications and even deaths^{15,17}. To date, few studies have been conducted concerning the relationship between psoriasis and migraine headaches. Unlike the method of the present study, few studies have investigated the prevalence of psoriasis in patients with migraine headaches^{18,19}.

The results of data analysis represented that 20.8% of our 72 patients with psoriasis vulgaris had migraine headaches. The mean and standard deviation of headache severity based on the MIDAS questionnaire in patients with migraines was significantly higher than the other group. Additionally, PASI scores were markedly higher in patients with migraines compared to the group without migraines.

In a similar study provided by Egeberg *et al.* in Denmark, the results represented that the ratio of migraine incidence in patients with mild, medium, and severe psoriasis were 1.37, 1.55, and 1.92, respectively. In that study, the prevalence of migraine headaches in patients with psoriasis was 9.72%, which is less than that found in the current study. Egeberg *et al.* found that psoriasis is associated with an increased risk of migraine headaches in both males and females independent of the measured confounders¹³.

Several studies have analyzed the pathophysiology of the relationship between migraine headaches and psoriasis. Pain and inflammation have been cited as two important factors in this relationship. Rises in the levels of tumor necrosis factor- α , increased activity of mitogen-activated protein kinases, and endothelial disorders are influential^{20,21}. Hence, an elevation in the concentration of tumor necrosis factor- α , released during the inflammation caused by psoriasis, can induce migraines in patients with psoriasis via cerebral vascular endothelial injury. Ultimately, controlling these inflammatory factors may even prevent migraine incidence in these patients^{22,23}. Waeber *et al.* stated that pro-

inflammatory cytokines are dependent on psoriasis (especially tumor necrosis factor- α), and their effects on vasospasm, meningeal inflammation, and increased sensitivity to the pain transduction pathways are influential in the increased prevalence of migraines in psoriasis patients¹⁴.

In addition to the strengths of this study, there were some limitations. One of these limitations was the fact that it was a single-centered study, which unavoidably imposes the problem of selection bias. On the other hand, according to the limitations of the measurement tools, the possibility of investigating other factors associated with migraine prevalence in patients with psoriasis was restricted. Another limitation was performing the study in an observational form instead of the intervention form, leading to the inevitable drawbacks of descriptive studies, such as short follow-up time. The pathophysiological mechanisms behind increased migraine prevalence in patients with psoriasis represented one of the study's ambiguities that should be explored in the future.

CONCLUSION

Among 72 patients with psoriasis vulgaris, 20.8% had migraine headaches, representing a significant proportion. Furthermore, patients with severe psoriasis were more likely to suffer from migraines. Given the paucity of related studies, screening for migraine prevalence and its risk factors in patients with psoriasis is recommended until further data become available.

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