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ORIGINAL ARTICLE

Methotrexate-Induced Lung Involvement in Psoriasis Patients: A single Centre Cross-Sectional Study

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ABSTRACT

Background: Methotrexate is used for psoriasis as first-line disease-modifying drugs however it may cause lung complications.
Objective: The aim of the current study was to find out the Prevalence of Methotrexate-Induced Lung Involvement in Psoriasis Patients.
Methodology: The current cross-sectional study was conducted at the department of dermatology Qazi Hussain Ahmad Medical Complex MTI Nowshera from October 2022 to October 2023 after taking approval from the ethical committee of the institute. A total of 78 individuals with psoriasis who visited the OPD were included. Each individual was receiving systemic methotrexate treatment. Details like age, gender, psoriasis type, and medication history were recorded in the patient files. Descriptive statistics, such as frequency counts and percentages, were used to analyze the data.
Results: A total of 78 participants of both genders were examined for psoriasis**.** Out of 78 individuals 12(16%) had mild to moderate and 5(6.6%) had severe lung involvement and 61(81.33%) had no lung complication. the most common kind of psoriasis examined was plaque psoriasis 65(86.6%) followed by Guttate psoriasis 5(6.6%) and Inverse psoriasis 3(4%) respectively. 57(73.0%) of the participants were receiving methotrexate treatment, whereas 43(55.1%)were receiving cyclosporine treatment, 14(17.9%) were receiving acitretin treatment, and 5(6.4%) we're receiving phototherapy treatment**.** Of the patients, 35 (44.8%) had been taking methotrexate for less than five years, and 35 (44.8%) had been taking it for 6-10 years
Conclusion: The results of the study reveal that while methotrexate-induced lung involvement is a potential adverse effect of long-term psoriasis treatment. 81.33% of the study's participants showed no signs of lung involvement. More research is necessary to determine whether long-term methotrexate use increases the risk of lung involvement in patients with psoriasis.
Keywords: Prevalence; Methotrexate; Lung Involvement; Psoriasis

INTRODUCTION

Methotrexate is a useful therapy for a number of non-malignant inflammatory diseases in addition to cancer.[1] It can be used for psoriasis as a first-line disease-modifying drugs.[2] This medication can be used as a stand-alone prescription or in together with different medicines, such as pills taken orally and more recent biological substances.[3] it not only changes the course of some diseases but can also save lives.[4] Psoriasis is a chronic inflammatory disease that results in thick, scaly skin plaques.[5] Over 7 million people in the US suffer with this skin disorder, making it one of the most common ones in the world.[6] Methotrexate is a common treatment for psoriasis and has been demonstrated to be helpful in reducing the disease's symptoms and development.[7] However, due of the systemic anti-inflammatory properties of methotrexate, there is also an increased risk of lung damage among individuals undergoing long-term treatment. Some of the symptoms of this poisoning include obliterative bronchiolitis, interstitial fibrosis, pneumonia, and pleuritis.[8] There has been evidence linking methotrexate to severe pulmonary damage.[9] Although the frequency of interstitial lung disease associated with methotrexate is unclear, it has been shown to be as prevalent as 11.6 percent in rheumatoid arthritis.[10] The tendency to acquire pulmonary infections especially pulmonary symptoms of the disorder itself, concurrent medication usage, and a greater likelihood of pulmonary mortality complicate studies of methotrexate-induced lung illness among rheumatoid arthritis populations.[11] Since the clinical and histological characteristics of methotrexate-related and rheumatoid arthritis-related interstitial lung disease overlap, making the distinction between the two conditions difficult, if not impossible.[12] For the purpose of early diagnosis of lung involvement caused by methotrexate, pulmonary function tests, and chest X-rays, and/or CT scans are essential.[13] If left untreated, this illness might be fatal.[14] However, not much is known about how frequently psoriasis patients from the Pakistani territory get methotrexate-induced lung involvement.so the current study was carried out to explore the Prevalence of Methotrexate-Induced Lung Involvement in Psoriasis Patients.

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METHODOLOGY

The current cross-sectional study was conducted at the department of dermatology Qazi Hussain Ahmad Medical Complex MTI Nowshera from October 2022 to October 2023 after taking approval from the ethical committee of the institute. A total of 78 individuals with psoriasis who visited the OPD were included. Each individual was receiving systemic methotrexate treatment. An examination of the case files and clinical assessments was done including pulmonary function tests, chest CT scans, and/or X-rays. When necessary, scans were performed to assess the degree of lung involvement. There was mild to moderate lung involvement, severe lung involvement, or no lung involvement at all. There was no discernible lung involvement. Reviewing the clinical assessments and case files of psoriasis patients revealed the information. Details like age, gender, psoriasis type, and medication history were recorded in the patient files. As needed, pulmonary function tests, chest CT scans, and/or X-rays were performed to assess lung involvement. Descriptive statistics, such as frequency counts and percentages, were used to analyze the data.

RESULTS

A total of 78 participants of both genders were examined for psoriasis .Out of which 38(48.7) % were male and 40 (51.2%) were females (figure 1). The age of the individuals were from 30 to 70 years. The most prevalent age group was of 30 to 39 years old (37(47.4%) followed by 50-69 years old 22(28.2%) respectively. The main features of the study participants are represented in table 1.Out of 78 individuals 12(16%) had mild to moderate and 5(6.6%) had severe lung involvement and 61(81.33%) had no lung complication as described in table 2., the most common kind of psoriasis examined was plaque psoriasis 65(86.6%) followed by

Guttate psoriasis 5(6.6%) and Inverse psoriasis 3(4%) respectively as described in figure 2. 57(73.0%) of the participants were receiving methotrexate treatment, whereas 43(55.1%)were receiving cyclosporine treatment, 14(17.9%) were receiving acitretin treatment, and 5(6.4%) we're receiving phototherapy treatment. Table 3. Of the patients, 35 (44.8%) had been taking methotrexate for less than five years, and 35 (44.8%) had been taking it for 6-10 years.(table 4)

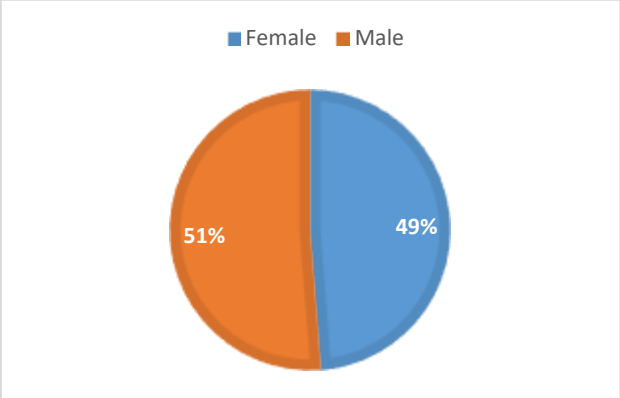

Figure 1: Gendre wise Distribution

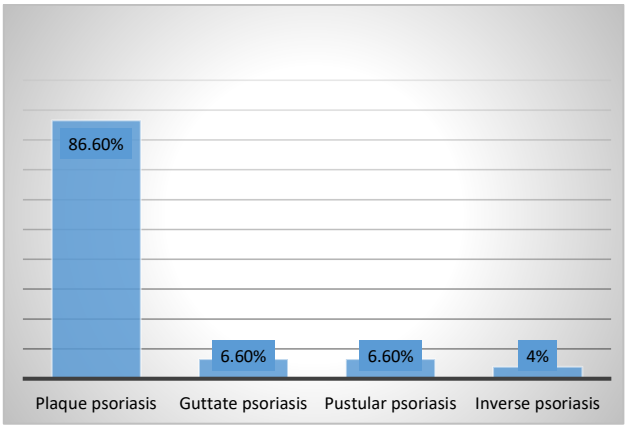

Figure 2: Frequency and kind of Psoriasis in the study among participants

Table 1: Demographic features of the study participants

Gender	N (%)
Male	38(48.7)%
Female	40 (51.2%)
Age in years	
<30 years old	15(19.2%)
30-49 years old	37(47.4%)
50-69 years old	22(28.2%)
≥70 years old	3(3.8%)

Table 2: Frequency of Lung Involvement

Absence of evident lung involvement	61(81.33%)
Mild to severe damage to the lungs	12(16%)
Severe involvement of the lungs	5(6.6%)

Table 3: Medication History

Methotrexate therapy	57(73.0%)
Cyclosporine therapy	43(55.1%)
Acitretin therapy	14(17.9%)
Phototherapy	5(6.4%)

Table 4: Period of Methotrexate Treatment N(%)

≤ 5 Years	35(44.8%)
6-10 Years	35(44.8%)
> 10 years	8(10.25%)

DISCUSSION

The anti-metabolite methotrexate is commonly used to treat psoriasis that is refractory to treatment.[15] It at low doses has a proven benefit.[16] The majority of individuals may take low doses of methotrexate with a usually long-lasting effect.[17] Interstitial pneumonitis is the primary methotrexate adverse effect that affects the lungs. Studies that combined various cytotoxic drugs with methotrexate at antineoplastic levels have indicated that its incidence ranges from 7 to 8%.[18] Patients with Psoriasis who are receiving long-term low doses of methotrexate have been shown to have abnormalities in their lung function.[19] A total of 78 participants of both genders were examined for psoriasis in the current study. The results show that 61(81.33%) individuals had no detectable lung involvement, 5(6.6%) had severe lung involvement, and 12(16%) people had mild to moderate lung involvement. This demonstrates that lung involvement is a possible adverse effect for psoriasis patients on long-term methotrexate treatment. This finding is consistent with other research that suggested that pulmonary damage might occur in as many as fifteen percent of individuals with psoriasis on low-to-moderate doses of methotrexate for longer than five years.[20] Gender did not substantially affect the frequency of methotrexate-induced lung involvement; however, the results did indicate that the oldest age group (the ones over 70) had the highest prevalence of lung involvement. This might imply that being older is an important risk indicator for methotrexate-induced lung involvement, but more studies with larger sample sizes are needed to confirm this. Plaque psoriasis, the most common kind of psoriasis, and affected 86.6% of the individuals in the current study. Similarly the same type of psoriasis was most prevalent in study conducted by Lyonset al.[21] In our study 57(73.0%) of the patients were receiving methotrexate treatment, whereas 43(55.1%) were receiving cyclosporine treatment, 14(17.9%) were receiving acitretin treatment, and 5(6.4%) receiving phototherapy treatment.13. Of the patients, 35(44.8%) had been taking methotrexate for less than five years, and 35(44.8%) had been taking it for more than five years.Thes findings are similar to the study conducted by Gautam et al.[22] It's critical to acknowledge the limitations of this study. To begin with, the research's sample size is rather small, therefore it could not fully represent all of the patients. Furthermore, due to the retrospective character of the research, biases related to memory and/or selection could have existed. Additionally, the diagnosis of lung involvement was established solely based on clinical assessments; no biochemical or histological tests were performed to conclusively validate the occurrence of methotrexate-induced lung involvement. Lastly, the duration of the patients' methotrexate treatment may not be correct because they self-reported it.

CONCLUSION

The results of the study reveal that while methotrexate-induced lung involvement is a potential adverse effect of long-term psoriasis treatment. 81.33% of the study's participants showed no signs of lung involvement. More research is necessary to determine whether long-term methotrexate use increases the risk of lung involvement in patients with psoriasis

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