Artikel Penelitian

Preliminary Report: An Online Web-Based Survey for Psoriasis Flare After Coronavirus Disease (COVID)-19 Vaccination in North Sumatera, Indonesia

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Abstract

Introduction: *Psoriasis is a chronic inflammatory skin disorder that is often associated with autoimmune conditions. Vaccination has been considered one of the external factors that can trigger psoriasis flare. Recently, there have been reports linking the COVID-19 vaccine to the occurrence of psoriasis flare. The objective of this study was to examine the impact of COVID-19 vaccination on the incidence of psoriasis flares in Indonesia.*
Methods: *This web-based cross-sectional study utilized Google forms and was conducted from September 2020 to February 2021 in North Sumatera, Indonesia. The study included psoriasis patients aged >18 years who had received COVID-19 vaccines. Data were collected and analyzed descriptively.*
Result: *Out of 130 respondents, most were women (60.8%) aged 26-35 years (33.1%) with a disease duration of 1-10 years (48.5%). The most common type of psoriasis before vaccination was plaque and scalp (20.4%). Approximately 80% had no history of COVID-19 infection prior to vaccination, and 71.5% received the Sinovac vaccine. Among them, 49 respondents (37.7%) experienced flares after vaccination, mainly following the first dose (57.1%) and predominantly with Sinovac (77.6%). Flares were more common in women (67.3%) aged 26-35 years (28.6%) with disease duration of 1-10 years (59.2%). Most flares occurred <2 weeks after vaccination (51%), and the post-vaccination type of psoriasis was frequently plaque and scalp (24.5%).*
Conclusion: *The incidence of psoriasis flares after COVID-19 vaccinations was 37.7%. The administration of COVID-19 vaccinations may play role as a potential trigger for flares in psoriasis patients.*

Keywords*: COVID-19, vaccination, psoriasis.*

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Laporan Awal: Survei Berbasis Situs Daring Mengenai Kekambuhan Psoriasis Pascavaksinasi Coronavirus Disease (COVID)-19 di Sumatera Utara, Indonesia

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Abstrak

Pendahuluan: *Psoriasis adalah kelainan kulit inflamasi kronik yang berhubungan dengan kondisi autoimun. Vaksinasi telah dianggap sebagai salah satu faktor eksternal dalam kekambuhan psoriasis. Oleh sebab itu, terdapat laporan pendahulu yang menghubungkan antara vaksinasi COVID-19 dengan kejadian kekambuhan psoriasis. Penelitian ini bertujuan untuk mengetahui pengaruh vaksinasi COVID-19 terhadap kejadian flare psoriasis di Sumatera Utara, Indonesia.*
Metode: *Studi pontong lintang berbasis situs daring ini menggunakan formulir Google dan dilakukan selama September 2020 hingga Februari 2021 di Sumatera Utara, Indonesia. Responden adalah pasien psoriasis berusia >18 tahun yang telah mendapatkan vaksinasi COVID-19. Data dikumpulkan dan dianalisis secara deskriptif.*
Hasil: *Dari 130 responden yang diperoleh, mayoritas adalah perempuan (60,8%) dengan kelompok usia 26-35 tahun (33,1%) dan lama penyakit 1-10 tahun (48,5%). Tipe psoriasis sebelum vaksinasi adalah plak dan kulit kepala (24,5%). Sekitar 80% responden tidak memiliki riwayat COVID-19 sebelum vaksinasi (80%), dan 71,5% responden mendapatkan vaksin Sinovac. Terdapat 49 responden (37,7%) yang mengalami kekambuhan psoriasis setelah vaksinasi, mayoritas terjadi setelah vaksinasi pertama (57,1%). Kekambuhan paling bayak dialami oleh perempuan (67,3%), kelompok usia 26-35 tahun (28,6%), responden dengan lama penyakit 1-10 tahun (59,2%). Kekambuhan paling banyak terjadi <2 minggu setelah vaksinasi, dan tipe psoriasis setelah vaksinasi adalah plak dan kulit kepala (24,5%).*
Kesimpulan: *Insidens kekambuhan psoriasis pascavaksinasi COVID-19 ditemukan sebesar 37.7%. Pemberian vaksinasi COVID-19 masih mungkin berperan sebagai salah satu faktor pemicu kekambuhan pada psoriasis.*

Kata kunci*: COVID-19, vaksinasi, psoriasis*

Introduction

Psoriasis is an immune-mediated chronic inflammatory skin disease characterized by epidermal hyperplasia, however it may also involve other systems such as arthritis, cardiovascular morbidity, and psychological problems.[1] It affects 0.91% to 8.5% of people worldwide with an estimated incidence of 60 cases per 100.000 per year globally. However, the incidence of psoriasis in Asia tends to be lower at 0.4%.[2,3] According to a report from the Department of Dermatology and Venereology of Dr. Soetomo General Academic Hospital, Surabaya, Indonesia, the prevalence of psoriasis in outpatient clinic from 2016 to 2018 was 0.19%, showing an increasing trend from previous years.[4] Meanwhile, at the Dermatology and Venereology Outpatient Clinic in Sanglah General Hospital, Bali, Indonesia, there were 70 new cases reported from 2012 to 2014.[5]

The onset of psoriasis is bimodal, typically peaking between the ages of 15 to 30 years and 50 to 60 years.[1,2] The incidence of psoriasis is the same between men and women.[1,3] However, several studies have reported a higher prevalence of psoriasis in men than in women.[3,6,7] The profile of psoriasis vulgaris in Adam Malik General Hospital, Medan, Indonesia, during January to December 2015 found that 89 patients were diagnosed with psoriasis vulgaris, with 31 patients (34.9%) being male and 58 patients (65.1%) being fe-

male.[7]

Clinical manifestation of psoriasis can be classified into several types, including psoriasis vulgaris, psoriasis inversa, guttate psoriasis, pustular psoriasis, and erythrodermic psoriasis.[8] The classic lesion typically consists of well-demarcated erythematous plaque with a white scaly surface.[1] Environment factors, genetics and epigenetics contribute to innate and adaptive immune system dysregulation in patients with psoriasis, leading to disturbances in differentiation and uncontrolled proliferation of keratinocyte.[8,9] The diagnosis of psoriasis is usually based on clinical examination, but in challenging cases, histopathologic examination can be useful.[1]

During the COVID-19 pandemic, COVID-19 vaccination plays a crucial role in reducing the risk of COVID-19 infections among psoriasis patients.[10,11] However, the reality is that vaccination is still low among patients with autoimmune diseases, including psoriasis. The low vaccination rate can be attributed to concerns regarding the safety and efficacy of the vaccine, as well as patients' lack of awareness about the increased risk of infection associated with both the disease itself and the treatments they receive.[11]

Although the Indonesian Association of Internal Medicine Specialists currently recommends administering COVID-19 vaccine to stable autoimmune patients, including those with psoriasis, there have been reports and studies indicating the occurrence of psoriasis flares or exacerbations in patients receiving certain COVID-19 vaccines such as Pfizer-BioNTech mRNA-BNT162b2 (Pfizer vaccine), Moderna mRNA-1273 (Moderna vaccine), and AstraZeneca-Oxford AZD1222 (AstraZeneca Vaccine).[12–15] However, other case reports involving psoriasis patients undergoing biologic agent therapy and receiving the Pfizer vaccine did not show any flare events.[16] Meanwhile, in accordance with our local regulations, the majority of the Indonesian population has received the inactivated Sinovac-CoronaVac vaccine (Sinovac vaccine), while a small portion has received the Sinopharm BBIBP-CorV vaccine (Sinopharm vaccine). Due to the limited data available on safety of COVID-19 vaccinations in psoriasis patients and the various types of COVID-19 used in Indonesia, researchers are interested in observing the incidence of psoriasis flare following the administration of the COVID-19 vaccines in Indonesia.

Methods

Study design

This is a web-based cross-sectional study conducted from September 2020 to February 2021 among psoriasis patients in the North Sumatera Province of Indonesia. The study utilized a self-administered online survey by using Google Forms for data collection. The study population consisted of psoriasis patients who were members of social media platforms such as Facebook groups and teledermatology platforms and have completed COVID-19 vaccination. The diagnosis of psoriasis was confirmed by their dermatologists, and these patients were engaged in the platforms for health management and follow-up. The survey questionnaire links were posted on the platforms without any incentives, ensuring that survey responses were anonymous. To ensure data quality, each participant could only submit the questionnaire once, and the questionnaire could only be submitted if all the required questions were answered. Electronic informed consent was obtained from all patients prior to their participation. This research was conducted in accordance with the principles outlined in the Declaration of Helsinki and was approved by the non-intervention ethics committee of the Faculty of Medicine, Prima Indonesia University, Medan (North Sumatera, Indonesia).

Questionnaires

The questionnaire comprised three dimensions. The first dimension included socio-dermographic status (5 questions), the second dimension encompassed disease status before vaccination (6 questions), and the third dimension encompassed post-vaccination disease status and history of post-vaccination flares (6 questions). The questions and options from the questionnaire were evaluated by two dermatologists and a statistician.

We collected socio-dermographic characteristics of respondents, such as age and gender. Additionally, we gathered information about the characteristics of psoriasis, including the duration of psoriasis, type of psoriasis before vaccination, the extent of psoriasis lesions before vaccination, the treatment received before vaccination, the history of COVID-19 infection before vaccination, type of COVID-19 vaccination received, the history of post vaccination psoriasis flares, the duration from vaccination to psoriasis flares, the dose of vaccination that caused flares, the type

of psoriasis post-vaccination, the extent of psoriasis lesions post-vaccination & at flares, and the history of treatment during flare-up.

Based on previous research, the age data will be grouped into the following categories: ≤25 years, 26-35 years, 36-45 years, 46-55 years, and ≥56 years. Meanwhile, the duration of the disease will be grouped into the following categories: <1 year, 1-10 years, 11- 20 years, and >20 years.[2] Additionally, the extent of psoriasis skin will be categorized as BSA <3%, BSA 3-10%, and BSA >10% based on previous studies.[17]

Statistical analysis

The data collected was analyzed descriptively using statistical software. The results were presented in frequency distribution tables, providing a clear overview of the data.

Results

This study involved 130 respondents with psoriasis who had received complete COVID-19 vaccinations. The respondents included 79 women (60.8%), with a mean age of 38.29±13.14 and dominated by the age group of 26-35 years (33.1%). The mean duration of psoriasis among the respondents was 13.13±10.45 years, with the majority having suffered from psoriasis for 1-10 years (48.5%). The most common types of treatment received by respondents prior to vaccination were topical corticosteroids (42.3%), followed by methotrexate (14.6%), topical vitamin D analogues (13.8%), systemic corticosteroids (10.8%), and biologic agents (10.8%). A majority of the respondents did not have a history of COVID-19 prior to vaccination (80.0%). The COVID-19 vaccines received by the respondents included Sinovac vaccine (71.5%), followed by Moderna vaccine

Table 1. Respondents' Body Surface Area and Psoriasis Types (N=130)

Variables	Before Vaccination		After Vaccination	
	n	%	n	%
Body Surface Area (BSA)				
<3%	63	48.5	61	46.9
3-10%	39	30.0	37	28.5
>10%	28	21.5	32	24.6
Psoriasis Types				
Plaque	23	17.7	27	20.8
Pustular	4	3.1	4	3.1
Scalp	15	11.5	16	12.3
Guttata	17	13.1	22	16.9
Inverse	5	3.8	5	3.8
Plaque + Pustular	2	1.6	0	0.0
Plaque + Scalp	18	13.8	19	14.6
Plaque + Guttata	6	4.6	4	3.1
Plaque + Inverse	2	1.5	2	1.5
Scalp + Guttata	14	10.8	11	8.5
Guttata + Inverse	1	0.8	0	0.0
Plaque + Scalp + Guttata	11	8.5	9	6.9
Plaque + Scalp + Inverse	1	0.8	0	0.0
Plaque + Scalp + Pustular	0	0.0	1	0.8
Plaque + Guttata + Inverse	1	0.8	1	0.8
Scalp + Guttata + Inverse	2	1.5	1	0.8
Plaque + Scalp + Guttata + Inverse	6	4.6	6	4.6
Plaque + Scalp + Pustular + Inverse	1	0.8	1	0.8
Plaque + Scalp + Pustular + Guttata + Inverse	1	0.8	0	0.0
Scalp + Inverse	0	0.0	1	0.8

(9.2%), AstraZeneca vaccine (6.9%), Pfizer vaccine (6.9%), Sinopharm vaccine (3.1%), and Sinovac followed by Moderna vaccine (3.1%). The majority of respondents did not experience psoriasis flares after COVID-19 vaccination (62.3%). The evolution of body surface area (BSA) among respondents before and after COVID-19 vaccinations is presented Table 1. The changes in the types of psoriasis experienced by the respondents before and after COVID-19 vaccinations are also shown in Table 1.

Characteristics of Psoriasis Patients Experienced Flares

Out of the total 130 psoriasis respondents who received COVID-19 vaccinations, 49 respondents (37.7%) experienced psoriasis flares (Table 2). Among those who experienced flares, the majority were women (67.3%), with the highest representation in the 25-year-old age group (30.6%), disease duration of 1-10 years (59.2%). The majority had a BSA before vaccination 3-10% (34.7%). The types of psoriasis observed before vaccination included plaque + scalp (20.4%), scalp + guttate (16.3%), plaque (14.3%), and guttate (12.2%). Topical corticosteroid treatment was commonly used by respondents experiencing flares (38.8%).

The Sinovac vaccine was received by the majority of respondents who experinced flares (77.6%). Psoriasis flares predominantly occurred after the first dose of the vaccine (57.1%), followed by the second dose (32.7%). The majority of flares occurred within <2 weeks (51%) and 2-4 weeks (42.9%) after vaccination, with a mean time from vaccination to flare of 17.25±23.53. Post vaccination, the majority of respondents had a BSA >10% (42.9%) or 3-10% (34.7%). The most types of psoriasis observed post-vaccination were plaque + scalp (24.5%), plaque (18.4%), and guttate (18.4%). Most respondents who experienced flares sought treatment (71.4%).

Table 2. Characteristic of Respondents Experiencing Flares (N=49)

Characteristics	n (%)
Sex	
Male	16 (32.7)
Female	33 (67.3)
Age (years)	
≤ 25	15 (30.6)
26–35	14 (28.6)
36–45	9 (18.4)
46–55	6 (12.2)
≥ 56	5 (10.2)
Disease Duration (years)	
< 1	3 (6.1)
1-10	29 (59.2)
11-20	9 (18.4)
> 20	8 (16.3)
Types of COVID-19 Vaccine	
Sinovac-CoronaVac	38 (77.6)
Pfizer-BioNTech mRNA-BNT162b2	1 (2.0)
Moderna mRNA-1273	3 (6.1)
AstraZeneca-Oxford AZD1222	2 (4.1)
Sinopharm BBIBP-CorV	2 (4.1)
Sinovac followed by Pfizer vaccine	1 (2.0)
Sinovac followed by Moderna vaccine	2 (4.1)
Duration from Vaccination to Flare (weeks)	
<2	25 (51.0)
2-4	21 (42.9)
> 4	3 (6.1)
BSA Before Vaccination	
<3%	16 (32.7)
3-10%	17 (34.7)
>10%	16 (32.7)
BSA Before Vaccination	
<3%	11 (22.4)
3-10%	17 (34.7)
>10%	21 (42.9)

**BSA, body surface area*

Discussion

From a total of 130 respondents, the majority of respondents were found to be women. This is consistent with several studies that have reported a higher proportion of women than men.[2,18] However, other literature states that the incidence of psoriasis does not differ between men and women.[1,7] The mean age of respondents in this study was 38.29±13.14 and was dominated by the age group of 26-35 years. The onset of psoriasis can occur at any age and generally happens between the ages of 15 and 30 years old.[1] The mean duration of psoriasis among the respondents in this study was 13.13±10.45 years, and the majority of respondents had suffered from psoriasis for 1-10 years. Several studies have reported the duration of psoriasis ranging from less than 5 years to 15 years.[2,7,19] However, psoriasis has an unpredictable disease course.[2]

To make it easier for respondents, we asked them to assess their skin rash using BSA. We found that before vaccination, 48.5% of patients had BSA <3%, 30% had BSA 3-10%, and 21.5% had BSA >10%. These results are similar to the study by Yeung, et al.[17] who reported psoriasis severity with BSA 2% (51.8%), BSA 3-10% (35.8%), and BSA >10% (12.4%). While Affandi, et al.[20] reported that 51.4% of patients had a BSA of 5-10%, 25.2% had BSA <5%, and 21.7% had BSA >10-90%. It's important to note that our results can be influenced by patient subjectivity in assessing the extent of disease lesions, which is one of the weaknesses of this study.

In our study, the majority of treatment respondents received topical treatments (corticosteroid and vitamin D analogues) prior to vaccination, while 43.9% of the respondents received systemic treatments. Affandi, et al.[20] reported that 93.6-95.4% of psoriasis patients receiving topical treatment, with topical steroids being the most commonly prescribed, followed by emollients, tar preparations, vitamin D analogues, and dithranol. Meanwhile, systemic treatment was used by 18.5% of psoriasis patients. The most commonly prescribed systemic treatment was methotrexate, followed by acitretin, sulfasalazine, and cyclosporine. Only 3.3% of patients received biologic agent therapy.[20]

The most common types of psoriasis in our respondents before vaccination were plaque (17.7%), followed by plaque and scalp (13.8%), guttata (13.1%), and scalp (11.5%). Psoriasis can manifest with various clinical features and the most common type of psoriasis is plaque.[1,10] Other studies have reported that plaque psoriasis was the most common type (85.1%), followed by the guttate (2.9%), erythrodermic (1.7%), and pustular (1.0%).[20] Similar studies also reported that the majority of psoriasis types found were plaque (82.2%), followed by erythrodermic (4.4%), pustular (3.3%), and guttate (2.2%) (21).[21]

About 20% of respondents had experienced a previous COVID-19 infection. A study reported that out of 61 psoriasis patients who received biologic agent therapy, only 10 patients (16.39%) had a history of COVID-19 infection before receiving therapy.[22] Other studies found no significant difference in the incidence of COVID-19 cases between psoriasis patients who received systemic therapy compared to the general population.[23–27] Psoriasis patients may have contracted the SARS-CoV-2 virus based on the spread of the pandemic in their place of residence.[23]

Around 62.3% of respondents did not experience psoriasis flares after vaccination. In Italy, there was a report of 4 patients with severe psoriasis who were on biologic agent and received the Pfizer vaccine when Psoriasis Area Severity Index (PASI) 100, and none of them reported flares.[16] Another prospective study also reported 436 patients with moderate-severe psoriasis who undergone biologic agent therapy. Out of those, 78 patients received two doses of the Pfizer vaccine, and none of them experienced flares.[28]

There are still limited studies and case reports regarding the incidence of psoriasis flares in patients receiving COVID-19 vaccination. One case report involves a 46-year-old man with psoriasis who was on deucravitinib therapy. The flare occurred 5 days after receiving the second dose of Pfizer COVID-19 mRNA vaccine, resulting in a PASI score to 18.5.[13] Another report describes 65-year-old man with a history of hepatocellular carcinoma and psoriasis. The patient received 9 months of nivolumab therapy for his carcinoma and showed an excellent response. However, nivolumab therapy had to be discontinued for 3 months due to psoriasis flares. The patient was then given apremilast therapy, calcipotriol, and topical clobetasol to control the flares. Subsequently, the patient received the first dose of Pfizer vaccine (BSA 10%), and a psoriasis flare occurred 1 week after vaccination (BSA >10%).[14] There is also a report from Greece involving 14 cases of psoriasis flare cases (5 men and 9 women) that occurred 10.36 days after receiving the second dose of the COVID-19 vaccine (Pfizer, Moderna, and AstraZeneca vaccine).[15] The exact association between the vaccine and psoriasis flare is still unknown. However, we found case reports of psoriasis flares after administration of other types of vaccines (BCG, tetanus-diphtheria, and influenza vaccine), and these reports found an increase in the production of IL-6 after vaccine administration, which promotes the development of Th17 cells that play a role in the pathogenesis of psoriasis.[29]

This preliminary report only assessed cross-sectional data, thus the temporal relationship between vaccination and flare could not be adequately evaluated. Other limitations included a small sample size and the risk of subjective assessment of skin rashes with BSA by the respondents. Several factors that may influence the psoriasis flares, such as infections, drugs, non-adherence to treatment, and behavioral and environmental factors, were not included in this study. Therefore, further

cohort study is needed in multiple health centers in Indonesia to obtain more robust data. Despite these limitations, the administration of COVID-19 vaccines should still be recommended, considering the benefits of vaccination in preventing COVID-19 infection in patients with immunologic disorders such as psoriasis. The occurrence of skin flares can be monitored by a dermatologist, providing patients with a sense of safety and ensuring prompt treatment.

Conclusion

Our study identified that over 30% of cases experienced psoriasis flares following COVID-19 vaccination. Psoriasis flares predominantly occurred after the first dose of the vaccine and within <2 weeks and 2-4 weeks after vaccination. Further studies are needed to confirm the association between COVID-19 vaccination and psoriasis flare.

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Conflict of Interests

We declare that there is no conflict of interest associated with this research.

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