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LETTER

Utilization of phototherapy and treatment response in adults with psoriasis: Data from the Malaysian Psoriasis Registry

Dear Editor,

Psoriasis is a chronic, relapsing skin disease, which is associated with comorbidities and economic burden. Treating psoriasis with phototherapy in South East Asia requires special considerations with regard to different dosing regimens and side effect profiles due to different skin types.[1,2] To our knowledge, there is no large population study or patient registries assessing the treatment outcome of phototherapy in psoriasis especially for patients with skin of color.

Malaysia is composed of different ethnicities with different skin phototypes. The Malaysian Psoriasis Registry (MPR) is a prospective cohort study with an ongoing collection of data of psoriasis patients in Malaysia. Analysis of the MPR data from July 2007 to December 2019 was performed with the aim to describe the utilization of phototherapy and treatment outcomes in adults with psoriasis. Of 20,898 adult psoriasis patients who were notified to the MPR, 547 patients (2.6%) underwent phototherapy within the last 6 months of MPR notification. The sociodemographic and clinical characteristics of the study population are demonstrated in Table 1. Comparisons were made between the cohort who received phototherapy and those who had not. There was a significantly higher proportion of males in the phototherapy cohort compared with those who did not receive phototherapy (63.6% vs. 56.0%). The phototherapy cohort group had more severe psoriasis with a significantly higher proportion of face and neck, scalp and nail involvement, a higher body mass index (BMI), as well as a higher rate of systemic therapy usage in the past 6 months compared with the non-phototherapy group. Forty-nine percent of the phototherapy cohort had a BSA involvement of >10% compared with 21.2% in the non-phototherapy cohort, and more patients in the phototherapy-treated group had poorer quality of life (QoL) compared with the non-phototherapy group (DLQI >10: 46.6% vs 37.3%).

The majority of patients (86.9%) had NBUVB. Pre- and post-treatment responses were analyzed after at least 3 months of phototherapy and based on serial follow-up data within 12 months. Meaningful clinical response is defined as improvement by at least 1 scale based on BSA (4 categories of severity based on BSA i.e. <5%, 5–10%, >10–90%, >90%) and/or DLQI improvement by at least 1 point, with no changes in topical therapy and systemic medication. There were 96 patients who had complete data for the assessment of treatment outcomes. Different outcomes were observed based on physicians' and patients' assessments in which BSA improvement was documented in 23 patients (40.4%) while DLQI improvement was documented in 53 patients (57.6%). DLQI improvement was documented in 11 patients (20.7%) despite static BSA involvement while 3 patients (5.7%) with worsening BSA showed improvement in DLQI. On the other hand, 7 patients (13.2%) experienced worsening of DLQI despite improvement in BSA, and another 3 patients (5.7%) experienced worsening of both DLQI and BSA involvement. Figure 1 shows comparison of QoL pre- and post-phototherapy according to the DLQI domains. There was significant improvement in the domains of "symptoms and feeling" and "leisure." Overall, approximately two-thirds (66.7%) of our phototherapy cohort achieved meaningful clinical response. A higher mean baseline DLQI was the only significant predictive factor for meaningful clinical response (12.8 ± 7.2 vs. 7.7 ± 5.3, $p = .001$).

In our cohort, phototherapy is underutilized as only 2.6% of patients had phototherapy even though one-fifth (21.2%) had a BSA involvement of >10%. This could be due to a lack of favorability among treating dermatologists and patient factors such as logistics and time off work. A higher willingness to attend regular phototherapy among the males is postulated for the observation of male preponderance in the phototherapy cohort. NBUVB remains the type of phototherapy of choice as it is as effective as PUVA, with fewer side effects.[3] BSA improvement was noted in 23 patients (40.4%). Among our phototherapy cohort, 39.1% were active smokers and 67.7% were obese. These are among the factors associated with poor response to phototherapy.[4] We were unable to compare our findings with other published data, which used PASI as a treatment endpoint. Our treatment response was based on improvement in BSA.

The improvement in DLQI post-phototherapy was consistent with previous studies.[5] It is interesting to know that some patients demonstrated improvement in their DLQI scores despite a status quo in BSA involvement. The different outcomes observed based on physicians' and patients' assessments can be explained by the improvement in symptoms as shown in Figure 1, thus enabling more social activities (leisure). Besides, the degree of improvement in terms of thickness, erythema, and scaliness was not captured with BSA assessment.

On the contrary, a few patients reported worsening of DLQI despite improvement of BSA. This concurred with Arora et al. where they concluded that clinical severity and quality of life improvement are independent of each other.[6] One possible explanation for this is

TABLE 1 Demographic and clinical characteristics of the studied population (adult patients ≥18 years old).

Demographic and clinical characteristics	Phototherapy cohort ($n = 547$)	Non-phototherapy cohort ($n = 20,351$)	p-Value*
Age of onset of psoriasis, mean (SD), year	29.9 ± 13.4	35.4 ± 23.1	**<.001**
Male: Female ratio	1.75: 1	1.27:1	**<.001**
Ethnicity, *n* (%)			
Malay	293 (53.6)	10,875 (53.5)	
Chinese	122 (22.3)	4005 (19.7)	
Indian	92 (16.8)	3344 (16.4)	
Others	40 (7.3)	2127 (10.5)	
Presence of family history of psoriasis, *n* (%)	155 (28.3)	4858 (24.1)	.018
Smoker, *n* (%)			
Total	399 (72.9)	15,559 (76.5)	.001
Present	156 (39.1)	4824 (31.0)	
Non Smoker	243 (60.9)	10,735 (69.0)	
Comorbidities, *n* (%)			
Dyslipidemia	98 (18.6)	3909 (19.9)	.457
Hypertension	136 (25.6)	5587 (28.2)	.185
Diabetes Mellitus	82 (15.5)	3761 (19)	**.039**
Ischaemic heart disease	22 (4.2)	115 (5.8)	.103
Cerebrovascular disease	8 (1.5)	361 (1.8)	.587
Body mass index, mean (SD), kg/m^2	27.59 ± 5.7	26.82 ± 5.8	**.004**
Obesity (BMI ≥25)[a]	338 (67.7)	10,809 (58.5)	**<.001**
Type of psoriasis, *n* (%)	*n = 518*	*n = 19,144*	–
Plaque	485 (93.6)	18,069 (94.4)	
Guttate	14 (2.7)	517 (2.7)	
Erythrodermic	15 (2.9)	304 (1.6)	
Inverse	0	94 (0.5)	
Pustular	4 (0.8)	160 (0.8)	
Body surface area (BSA) scale, *n* (%)	*n = 384*	*n = 14,163*	–
<5%	84 (21.9)	7092 (50.1)	
5%–10%	111 (28.9)	4060 (28.7)	
>10%–90%	179 (46.6)	2761 (19.5)	
>90%	10 (2.6)	250 (1.7)	
Nail disease, *n* (%)	400 (74.1)	11,125 (55.1)	**<.001**
Scalp involvement, *n* (%)	425 (86.7)	14,557 (78.7)	**<.001**
Face and neck involvement, *n* (%)	335 (68.5)	9179 (50.1)	**<.001**
Psoriatic arthropathy, *n* (%)	78 (14.5)	2724 (13.5)	.512
Systemic treatment received in the past 6 months, *n* (%) excluding biologics	192 (35.4)	3747 (18.5)	**<.001**
Biologic treatment received in the past 6 months	14 (2.9)	165 (0.9)	**<.001**
DLQI, mean (SD)	11.0 ± 6.9	9.2 ± 6.7	**<.001**
DLQI >10, *n* (%)	248 (46.6)	7314 (37.3)	**<.001**
Severe psoriasis (BSA >10 and/or DLQI >10)	329 (60.4)	8741(43.5)	**<.001**
Phototherapy modalities			
NBUVB	475 (86.9)		
BBUVB	16 (2.9)		
Topical PUVA	11 (2.0)		
Oral PUVA	10 (1.8)		

TABLE 1 (Continued)

Demographic and clinical characteristics	Phototherapy cohort (n = 547)	Non-phototherapy cohort (n = 20,351)	p-Value*
Bath PUVA	6 (1.1)		
Excimer Laser	2 (0.4)		
Not specified	27 (4.9)		
Change in BSA scale[b], n = 57 (%)[c]			
Worsen	8 (14.0)		
No change (same scale)	26 (45.6)		
Improved by at least 1 scale	23 (40.4)		
Change in DLQI score, n = 92 (%)[d]			
Increased ≥5	10 (10.9)		
Increased <5	19 (20.6)		
No change	10 (10.9)		
Reduced <5	30 (32.6)		
Reduced ≥5	23 (25.0)		

Abbreviations: BMI, body mass index; BBUVB, broad band ultraviolet B; DLQI, dermatology life quality index; NBUVB, narrow band ultraviolet B; PUVA, psoralen with ultraviolet A; SD, standard deviation.

[a]Asia-Pacific body mass index classification.

[b]BSA scales = <5%, 5–10%, >10–90%, >90%.

[c]Missing data for BSA = 39.

[d]Missing data for DLQI = 4.

*Unknown cases were not included in the analysis.

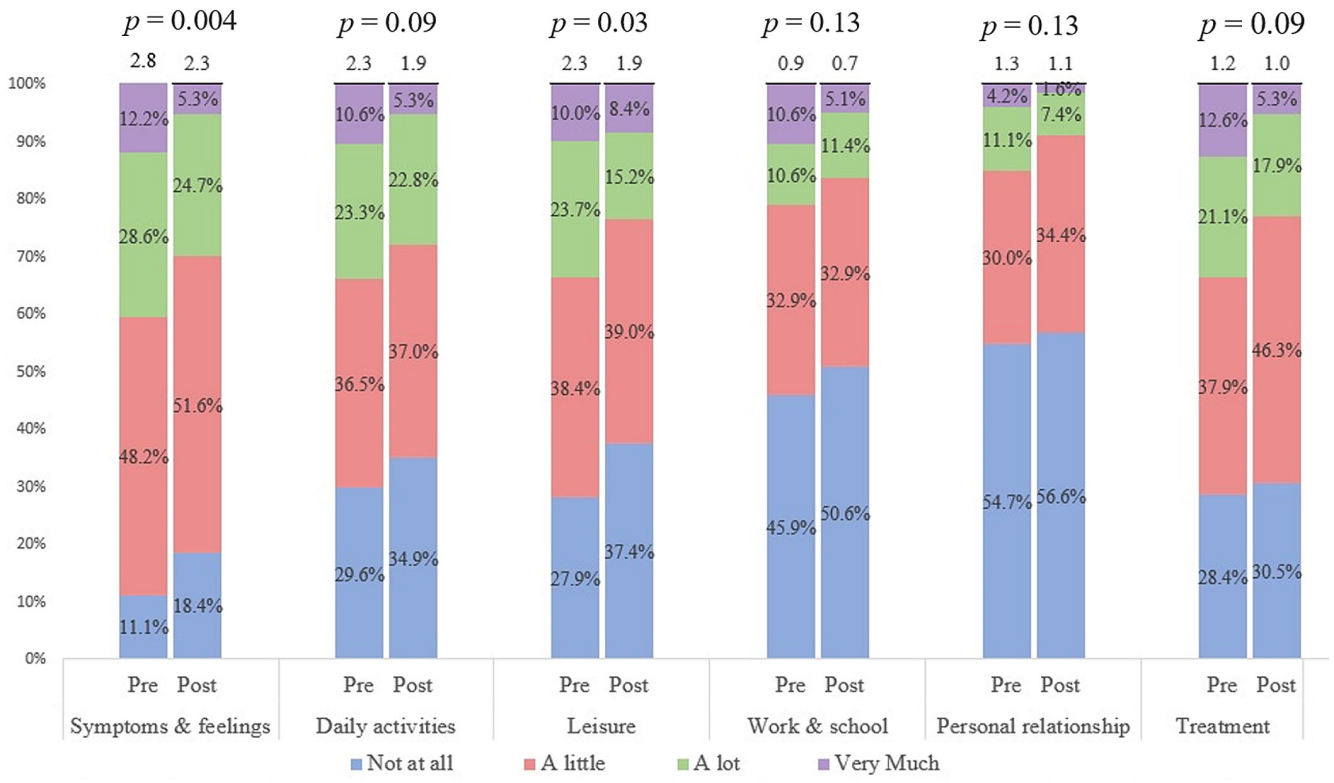

FIGURE 1 Comparison of quality of life impairment by DLQI domains and mean DLQI scores pre- and post-phototherapy.

that the outcomes of phototherapy do not meet the expectations of patients. Furthermore, the inconvenience and side effects of phototherapy may have affected their quality of life.

The introduction of biologics has been thought to have decreased the utilization of phototherapy. However, recent analysis showed increased phototherapy utilization in the United States between

year 2000 and 2015 with higher trends for UVB and excimer laser.[7] Phototherapy has consistently shown to be one of the cost-effective options based on PASI and DLQI improvement.[8] The new aspects of phototherapy such as home phototherapy have gained interest. Furthermore, caution needs to be exercised when prescribing biologics in the era of COVID-19.[9]

One of the limitations of our study was the documentation of BSA in categories (pre-determined 4 scales) instead of absolute values. The protocol for phototherapy was not standardized across different centeres, and compliance to the phototherapy schedule could not be ensured. Phototherapy may have stopped early due to side effects or commitment issues before the expectant improvement could be observed. In summary, phototherapy continues to be a valuable tool in the battle against psoriasis in the biologic era as approximately 66.7% achieved meaningful clinical response in our cohort. Careful patient selection is paramount. A well-established protocol for phototherapy in skin of color is warranted.

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CONFLICT OF INTEREST STATEMENT

The authors hereby certify that, to the best of our knowledge, the work which is reported in the said manuscript has not received financial support from any pharmaceutical company or other commercial sources and neither us nor any first degree relative have any special financial interest in the subject matter discussed in the said manuscript.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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