



# A cross-sectional questionnaire study in a phototherapy unit during COVID-19

Francine Batista Costa<sup>1</sup> · Patrícia Lima Baptista<sup>1</sup> · Rodrigo Pereira Duquia<sup>1</sup>

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## Abstract

**Background** In March 2020, social isolation measures were imposed in Brazil to contain the spread of the novel coronavirus (SARS-CoV-2), requiring health services to implement contingency plans. The main objective of the study was to verify the status of the disease, self-reported by patients who discontinued phototherapy, during a period of social isolation.

**Methods** All patients receiving phototherapy at the Santa Casa de Porto Alegre, Brazil, prior to the implementation of social distancing measures were eligible for inclusion in the study. 86 patients answered a questionnaire during a medical evaluation.

**Results** 95% of patients who stopped phototherapy reported a worsening of disease status. Only 19% of patients continued to attend phototherapy sessions during the social isolation period.

**Conclusion** The COVID-19 pandemic led most patients to stop phototherapy, resulting in the perception of increased disease severity in an outpatient sample in southern Brazil.

**Keywords** COVID-19 · Phototherapy · Psoriasis · Vitiligo · Cutaneous T-cell lymphoma

## 1 Introduction

In late 2019, a novel coronavirus led to an outbreak of pneumonia in the city of Wuhan, in the Chinese province of Hubei. The illness, referred to as coronavirus disease 2019 (COVID-19), spread rapidly to all continents around the world [1].

In March 2020, a Municipal Decree in the city of Porto Alegre, Brazil, imposed social distancing measures to control the spread of the novel coronavirus (SARS-CoV-2) and give time for health care services to implement contingency plans. At that point, no recommendations had been published regarding the application of phototherapy during the pandemic; some services around the world continued to provide treatment while others opted to close due to difficulties maintaining social distancing, that is care and measures to reduce the movement of people and the virus in collective spaces [2]. Phototherapy is indicated for the control of skin diseases, such as psoriasis, vitiligo, cutaneous T-cell

lymphoma, atopic dermatitis, graft vs host disease, pruritus, and scleroderma. Treatment consists of irradiation of the skin with ultraviolet light emitted by a specific device. At the Dermatology Service of the Hospital Santa Casa de Misericórdia de Porto Alegre, the Phototherapy Unit closed for a week to implement safety and hygiene measures before initiating a new model of patient care. Phototherapy sessions are supervised by medical staff or trained nurse technicians and all our patients are referred by their dermatologists.

This study was conducted during the COVID-19 pandemic, providing an assessment of disease status in patients who stopped receiving phototherapy.

## 2 Materials and methods

A cross-sectional study was conducted involving all patients receiving phototherapy before the implementation of social distancing measures on March 23, 2020 as a way to contain the SARS-CoV-2 pandemic when we were forced to evaluate the risks and benefits of continued phototherapy vs the risk of infection by a novel, unknown, and highly contagious virus. Data on the variables studied were collected by the medical staff only on the patient's first return to the phototherapy unit from August 3, 2020, when the project was

✉ Francine Batista Costa  
francine.dermato@gmail.com

<sup>1</sup> Department of Dermatology, Santa Casa de Misericórdia de Porto Alegre, 135, Annes Dias St., Porto Alegre, Rio Grande Do Sul, RS 90040-001, Brazil

approved by the hospital's research ethics committee, until January 31, 2021. All patients provided written consent to participate in the study.

In March 2020, action plans were created for each patient, recommending whether or not they should continue phototherapy. These plans were developed based on orientations of the Brazilian Ministry of Health, which recommended the adoption of social isolation measures especially in high-risk groups consisting of individuals aged 60 years and older, people with immunological deficiency, and/or chronic or severe illnesses, such as asthma, diabetes, heart disease, among others and those who were pregnant or breastfeeding [3].

Additionally, we also analyzed the patients' records and took into account the severity of their skin disease and city of residence, because many patients use public transport to go to the hospital 2 or 3 times a week for phototherapy sessions. We believe that these patients would not be able to safely access the unit during the period of social isolation due to the high risk of infection associated with crowded public transport services. Patients with vitiligo, who do not have systemic symptoms, were asked to postpone treatment for at least 2 months since this temporary interruption represented a much lower health risk to these individuals than the possibility of infection with COVID-19.

86 patients were interviewed using a questionnaire in a medical appointment to assess variables such as self-reported disease status in those who stopped phototherapy, and demographic data, such as age, sex, phototype, dermatologic indication, and health care sector (public or private/insurance). We also examined whether the patient stopped phototherapy on the advice of the medical staff or of their own accord and whether in the current medical assessment the patient maintains an indication for phototherapy based on the patient's disease status. Data were analyzed using descriptive statistics to obtain raw values, percentages, and proportions.

### 3 Results

86 patients participated in the study. They had a mean age of 46 (SD, 18) years and were predominantly female (56%), with Fitzpatrick phototype I–III (74%). Two-thirds of patients lived in the city of Porto Alegre and 92% were treated in the private health care system (out of pocket or insurance). The most common indication for phototherapy in the sample was psoriasis (57%) followed by vitiligo (22%) and cutaneous T-cell lymphoma (9%). 81% of patients stopped phototherapy during the study period, with 48% doing so on medical recommendation and 34% doing so on their own accord. Only 19% of patients continued to receive treatment (Table 1).

**Table 1** Patient characteristics ( $n = 86$ )

Characteristics	<i>n</i>	%
Gender		
Female	48	55.8
Male	38	44.2
Phototype		
I–III	64	74.4
IV–VI	22	25.6
City of residence		
Porto Alegre	56	65.1
Other	30	34.9
Health sector		
Private	79	91.9
Public	7	8.1
Diagnosis		
Psoriasis	49	57.0
Vitiligo	19	22.0
Cutaneous T-cell lymphoma	8	9.3
Graft-vs-host disease	2	2.3
Atopic dermatitis	2	2.3
Parapsoriasis	2	2.3
Pityriasis lichenoides chronica	1	1.2
Progressive macular hypomelanosis	1	1.2
Scleroderma	1	1.2
Seborrheic dermatitis	1	1.2
Stopped phototherapy		
Yes, on medical recommendation	41	47.7
Yes, of own accord	29	33.7
No	16	18.6

42% of patients ( $n = 36$ ) who stopped phototherapy used other treatments. 17 of the 36 patients used topical corticosteroids, eight used topical tacrolimus, three were on systemic methotrexate therapy and a further three were on immunobiological drugs. These treatments were prescribed by their dermatologists in 83% of cases while 14% of patients were self-medicating. It was not verified when these medications were introduced in relation to the suspension of phototherapy (Table 2).

42 of the 86 patients in the study reported worsening disease status during social isolation due to phototherapy restriction. However, among patients who stopped phototherapy for any reason, this figure was found to be 95%. 93% of patients, whose illness worsened after stopping phototherapy, still had an indication for phototherapy in the phototherapist's assessment, while 7% did not have it due to the worsening of the disease status and these patients had started immunobiological prescribed by their dermatologists. The subset of participants whose disease status deteriorated after stopping phototherapy was 70% female, with a diagnosis of psoriasis in 73% of cases,

**Table 2** Use of other treatments by patients who stopped phototherapy ( $n=36$ ; 42%)

Treatment modalities	<i>n</i>	%
Topical corticosteroids	17	47
Topical tacrolimus	8	22
Calcipotriol + betamethasone	4	11
Methotrexate	3	8.5
Immunobiologicals	3	8.5
Anti-histamines	1	3
Prescribed by		
Dermatologist	30	83
Physician (non-dermatologist)	1	3
Self-medicated	5	14

**Table 3** Disease status and characteristics of patients whose illness worsened after stopping phototherapy

Disease status	<i>n</i>	%
Disease status declined		
No	44	51
Yes	42	49
Disease status declined and stopped phototherapy	40	95
Disease status declined and continued phototherapy	2	5
Characteristics of patients whose illness worsened after stopping phototherapy		
Gender		
Female	28	70
Male	12	30
Diagnosis		
Psoriasis	29	73
Vitiligo	6	15
Cutaneous T-cell lymphoma	2	5
Other	3	7
Medical assessment		
Phototherapy still indicated	37	93
Phototherapy not indicated due to disease progression	3	7

vitiligo in 15%, and cutaneous T-cell lymphoma in 5% of cases (Table 3).

The medical assessment revealed that 66 of the 86 patients (77%), most of whom had vitiligo, were still prescribed phototherapy, while 17/86 (20%) no longer required treatment due to improved or controlled disease, and 3/86 (4%) were not indicated to continue phototherapy due to worsening illness and need systemic medication.

Since most of our samples were composed of patients in the private health sector, our results are limited to this population.

## 4 Comment

Our phototherapy unit performed an average of 792 phototherapy sessions a month in 2019, including seasonal variations. In 2020, there was a drop in the number of patients, and the mean number of sessions decreased by 56% to a monthly average of 346.

Fisher et al. [4] found that 53.5% of phototherapy patients in a large dermatology clinic in northeastern Israel stopped attending treatment sessions during the social isolation period. In the present study, 81% of the patients stopped phototherapy, with 34% having done so on medical recommendation and the remaining participants doing so of their own accord. We assumed that our patients' conditions would decline with the interruption of phototherapy, and 95% of patients who stopped treatment indeed believe that their illness worsened during the study period.

Additionally, we found that 42% of the 36 patients who stopped phototherapy used other treatments, with topical glucocorticoids being the most common (47%). Self-medication occurred in 14% of cases. However, Choudhary et al. [5] published a study of 100 patients seen in an outpatient dermatology clinic and found that the prevalence of self-medication increased to 48% during social isolation due to COVID-19 from a previous value of 15%.

The risk of SARS-CoV-2 transmission in phototherapy units is unknown [2, 6, 7]. In July 2020, Lim et al. [2] published recommendations for how to manage and deliver phototherapy services during the pandemic based on the consensus opinion of experts. The recommendations aimed to balance risks and benefits for patients while ensuring the safety of workers at the phototherapy service. Shortly afterward, the Spanish Photobiology Group of the Spanish Academy of Dermatology and Venerology published similar recommendations. Also, Aguilera et al. [6] suggest that all of recommendations may limit the number of phototherapy treatments compared to pre-COVID-19 pandemic standards. This circumstance may condition the consideration of alternative treatments in some cases and certain pathologies, and the restriction of indications to those with the best response possibilities or with few therapeutic alternatives.

Specialists recommend that phototherapy units should operate based on local public health recommendations and the orientations of the infection control center of the institution where the service is located since the risk of coronavirus infection depends on the local prevalence of the illness [2]. Elmasry et al. [7] suggested that low-risk patients with indolent cutaneous lymphoma could postpone phototherapy and be treated with potent topical steroids. From the start of the social distancing period, our

phototherapy unit followed recommendations which were in line with those of the hospital's infection control service and the national Ministry of Health even though neither set of guidelines had been specifically developed for phototherapy services.

Phototherapy is an important treatment option for chronic skin diseases and T-cell lymphomas, and the decision to continue treatment during a pandemic must be made based on an assessment of risks and benefits. Publications of recommendations on how to manage phototherapy services during the pandemic such as those cited in this paper are important to ensure that phototherapy services can operate safely in these uncertain times. Ninety-five percent of patients who stopped phototherapy for any reason reported a worsening of disease status and is difficult to determine how many patients avoided SARS-CoV-2 infection because of this decision.

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**Availability of data and material** Not applicable.

**Code availability** Not applicable.

## Declarations

**Conflict of interest** All authors declare that they have no conflict of interest.

**Ethics approval** ISCMPA proposing institution CAAE: 33845020.5.0000.5335.

**Consent to participate** Written consent to enter the study.

**Consent for publication** The authors declare consent for publication of a technical note sent to Photochemical & Photobiological Sciences.

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