



# Prevalence study of dermatoses referred to the phototherapy unit at the Dermatology Service of the Clinics Hospital of Porto Alegre, RS, Brazil\*

Estudo de prevalência das dermatoses encaminhadas ao setor de fototerapia do ambulatório de dermatologia do Hospital de Clínicas de Porto Alegre, RS, Brasil

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**ABSTRACT: BACKGROUND:** Phototherapy consists of exposure to ultraviolet radiation for therapeutic reasons. Radiation is already used in dermatological practice, and many studies have already proved the beneficial effect of UV light treatment for chronic inflammatory or lymphoproliferative skin diseases. The Dermatology Service of the Clinics Hospital of Porto Alegre (Hospital de Clínicas de Porto Alegre) has been using phototherapy for a long time, and no official data have been described so far.

**OBJECTIVES:** To study the prevalence of dermatoses referred to the phototherapy unit at the Clinics Hospital of Porto Alegre and describe the total number of patients who have already been referred to this sector and their phototype.

**METHODS:** This is a descriptive cross-sectional study. Data were collected through a review of the phototherapy patients' records (secondary data), which are available on a database of the Dermatology Service of the Clinics Hospital of Porto Alegre, from August 1997 to July 2011.

**RESULTS:** A total of 653 records were analyzed. Phototype 3 was the most prevalent (n=313). Distribution of the prevalence of dermatoses referred to the phototherapy unit was as follows: vitiligo (279), psoriasis (255), cutaneous T-cell lymphoma/mycosis fungoides (29), graft-versus-host disease (15), scleroderma (11), atopic dermatitis (10), alopecia areata (6), parapsoriasis (5), eczema (4), granuloma annulare (4), and others (35). As vitiligo and psoriasis were the two most prevalent dermatoses, they were analyzed separately, with no statistical difference in prevalence between them (P=0,177).

**CONCLUSIONS:** Our findings are in accordance with the literature, showing that although phototherapy is still mostly indicated to treat psoriasis, it has been used to treat other dermatoses, since the results are promising.

**Keywords:** Photochemotherapy; Phototherapy; Prevalence

**Resumo: FUNDAMENTOS:** Fototerapia é exposição à radiação ultravioleta para uso terapêutico. O uso dessas radiações já é utilizado na prática dermatológica, e estudos já provaram o efeito benéfico do tratamento UV em doenças inflamatórias crônicas ou linfoproliferativas. O Serviço de Dermatologia do Hospital de Clínicas de Porto Alegre tem disponibilizado a fototerapia para seus pacientes há um longo tempo, sem dados oficiais descritos até então.

**OBJETIVO:** Estudar a prevalência das dermatoses encaminhadas à fototerapia do Hospital de Clínicas de Porto Alegre e descrever o número total de pacientes já encaminhados a esse setor e seu fototipo.

**MÉTODOS:** Estudo transversal descritivo. A coleta de dados foi feita por revisão da totalidade das fichas de cadastro dos pacientes de fototerapia (dados secundários), as quais se encontram em um banco de dados no Serviço de Dermatologia do Hospital de Clínicas de Porto Alegre, de agosto de 1997 a julho de 2011.

**RESULTADOS:** Ao todo 653 pacientes foram analisados. O fototipo 3 foi o mais prevalente (n=313). A distribuição da prevalência das dermatoses foi: vitiligo (279), psoríase (255), linfoma cutâneo de células T/ micose fungóide (29), doença do enxerto versus hospedeiro (15), esclerodermia (11), dermatite atópica (10), alopecia areata (6), parapsoríase (5), eczema (4), granuloma anular (4) e outros (35). Visto que vitiligo e psoríase foram as dermatoses mais prevalentes, eles foram analisados separadamente. Não houve diferença estatística entre as prevalências (P = 0, 177).

**CONCLUSÕES:** Nossos resultados estão em conformidade com a literatura, e mostram que, apesar da psoríase ainda ser a principal indicação para a fototerapia, outras dermatoses estão sendo tratadas com ela, uma vez que seus resultados tem sido promissores.

**Palavras-chave:** Fotoquimioterapia; Fototerapia; Prevalência

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## INTRODUCTION

Phototherapy consists of exposure to ultraviolet radiation (UVR) for therapeutic reasons and it can be done using natural light, ultraviolet A (UVA) or ultraviolet B (UVB) light.<sup>1</sup> It uses controlled and repetitive UV exposures to change cutaneous physiopathology in order to induce regression or control the evolution of dermatoses.<sup>2</sup>

Both UVA and UVB lights are known to cause changes in the DNA of cells.<sup>3</sup> UVB radiation causes direct damage in cellular DNA, whereas UVA radiation causes indirect damage through the production of reactive oxygen species (ROS) by stimulating endogenous photosensitizers.<sup>4</sup>

Administration of a photosensitizing chemical substance in combination with UV radiation, called *Photochemotherapy*, is another mode of phototherapy. It usually uses psoralen (a photosensitizer) combined with UVA radiation (PUVA).<sup>1</sup> The intensity of the reaction depends on its concentration and time of exposure to the sun or to UV radiation.<sup>5</sup>

The mechanism of action of phototherapy is mainly based on a change in the immune response of the skin. UVB radiation, due to its shorter wavelength, acts primarily on epidermal keratinocytes and Langerhans cells. On the other hand, UVA radiation, with a longer wavelength, acts on dermal fibroblasts, endothelial cells, mast cells, granulocytes, and lymphocytes T of the dermis.<sup>6</sup>

Radiation is already used in dermatological practice, and many studies have already proved the beneficial effect of UV light treatment for chronic inflammatory or lymphoproliferative skin diseases.<sup>7</sup> Initially used for treatment of psoriasis, phototherapy has been used nowadays to treat various other dermatoses such as vitiligo, atopic dermatitis, pruritus, and cutaneous T-cell lymphoma/mycosis fungoides.<sup>3</sup> It is mostly indicated for treatment of psoriasis. The spreading, seborrheic, and superficial forms present the best response. In vitiligo, best responses are achieved on the face and trunk, with more repigmentation and less erythema. It can be indicated for children, and secondary effects are minimum.<sup>3</sup> In cases of severe and widespread atopic dermatitis, in which the use of corticosteroids can lead to important secondary effects, the use of phototherapy is indicated. Initial forms of parapsoriasis and mycosis fungoides respond well to phototherapy, which may provide long-term remission and delay extracutaneous spread.<sup>1</sup>

Despite being a widespread treatment, the knowledge of the prevalence of dermatoses treated with this therapeutic modality is relevant, since it can assist in the strategic planning of Services that offer such a therapeutic option. The Dermatology Service of

the Clinics Hospital of Porto Alegre (HCPA) has been using phototherapy with UVA light and broadband UVB for a long time. More recently, narrowband UVB has also been made available. However, there are neither official data on the number of patients treated or undergoing treatment, nor on their dermatological indications or prevalence since phototherapy was installed. There is a preliminary study that has analyzed the demographic data only of patients with psoriasis or vitiligo referred to the phototherapy unit.<sup>8</sup> Based on that, this study was designed to determine the prevalence of dermatoses referred to the phototherapy unit at the Dermatology Service of the Clinics Hospital of Porto Alegre (HCPA).

## MATERIAL AND METHODS

This is a descriptive cross-sectional study designed in the phototherapy unit at the Dermatology Service of the Clinics Hospital of Porto Alegre (HCPA).

The overall objective is to study the prevalence of dermatoses referred to the phototherapy unit. The secondary objective is to describe the total number of patients undergoing treatment or who have already been followed up in this sector and describe their phototype, based on Fitzpatrick's classification system.<sup>9</sup>

Data were collected through a review of the total number of phototherapy patients' records (secondary data) available on a database of the Dermatology Service from August 1997 to July 2011. They were collected in October, 2011. Inclusion criteria were all patients who had undergone treatment or were undergoing treatment with phototherapy for any period of time and due to any dermatological indication at the Dermatology Service of HCPA. The exclusion criteria were patients without registered data.

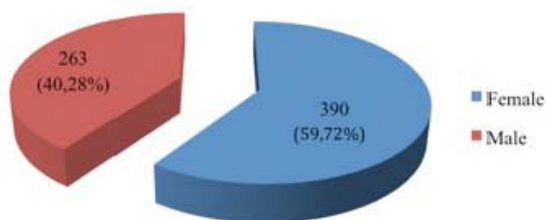
The data were stored on a database in Excel. The results of the study were presented in percentage and absolute numbers. These proportions will be compared using the *chi-square test*, with a level of significance of  $p < 0.05$ .

The study was approved by the Research Ethics Committee of the Clinics Hospital of Porto Alegre (number of project: 110410).

## RESULTS

A total of 653 patients' records were analyzed, and there were no missing data. There were 390 female and 263 male as shown in graph 1. Distribution of the patients according to phototype is presented in graph 2. The most prevalent one was phototype 3 (313).

All of the dermatoses referred to the phototherapy unit are listed in absolute numbers, as seen in graph 3. In order to better analyze the indications for



GRAPH 1: Gender distribution of population

phototherapy, the most prevalent dermatoses were brought together. In this analysis, the least prevalent indications for phototherapy were grouped as "Others". The corresponding absolute number of patients for each dermatosis is presented in parenthesis based on decreasing prevalence: vitiligo (279), psoriasis (255), cutaneous T-cell lymphoma-CTCL/mycosis fungoides (29), graft-versus-host disease-GVHD (15), scleroderma (11), atopic dermatitis (10), alopecia areata (6), parapsoriasis (5), eczema (4), granuloma annulare (4), and others (35). The same results are presented in percentages of absolute values in graph 4.

As vitiligo and psoriasis were the two most prevalent dermatoses for which phototherapy was indicated, they were analyzed separately. There was no statistical difference in terms of prevalence between them. ( $P=0,177$ )

## DISCUSSION

Phototherapy has been used for treatment of various dermatoses such as psoriasis, vitiligo, mycosis fungoides, cutaneous T-cell lymphoma, solar polymorpha eruption, atopic dermatitis, urticaria, pityriasis-rosea, pruritus, among others.<sup>2,3</sup>

Considering treatment with UVB radiation, it is advisable that initial doses of phototherapy are individualized by determining the minimum erythema dose (MED), which is the lowest dose of UVB required

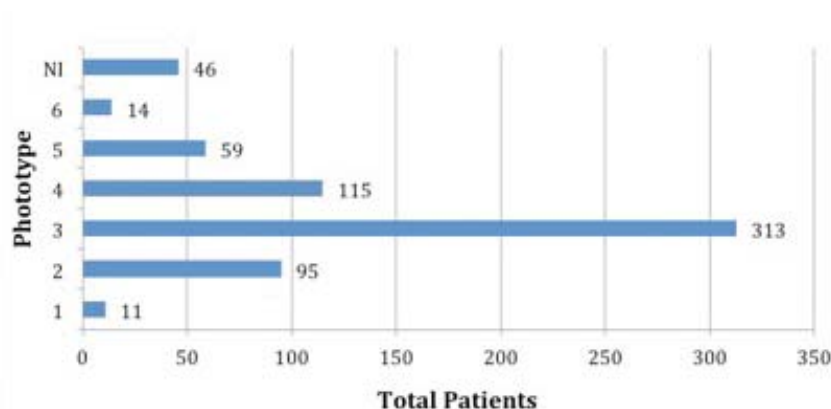
to produce a noticeable erythema in the radiated area after 24 hours.<sup>2</sup> For UVA, determination of the minimum phototoxic dose (MPD) is the most accurate method in assessing individual response to exposure to UVA radiation, but classification of the patient's phototype is also important.<sup>10</sup>

The analysis of phototype is performed in all patients before starting treatment with phototherapy at the Dermatology Service of the Clinics Hospital of Porto Alegre (HCPA). We evaluated this item in our study and found a higher prevalence of lighter phototypes. These data can be due to the fact that in southern Brazil, where the Clinics Hospital of Porto Alegre (HCPA) is located, there is a greater prevalence of people with fair skin, descendants of Germans and Italians.<sup>11</sup>

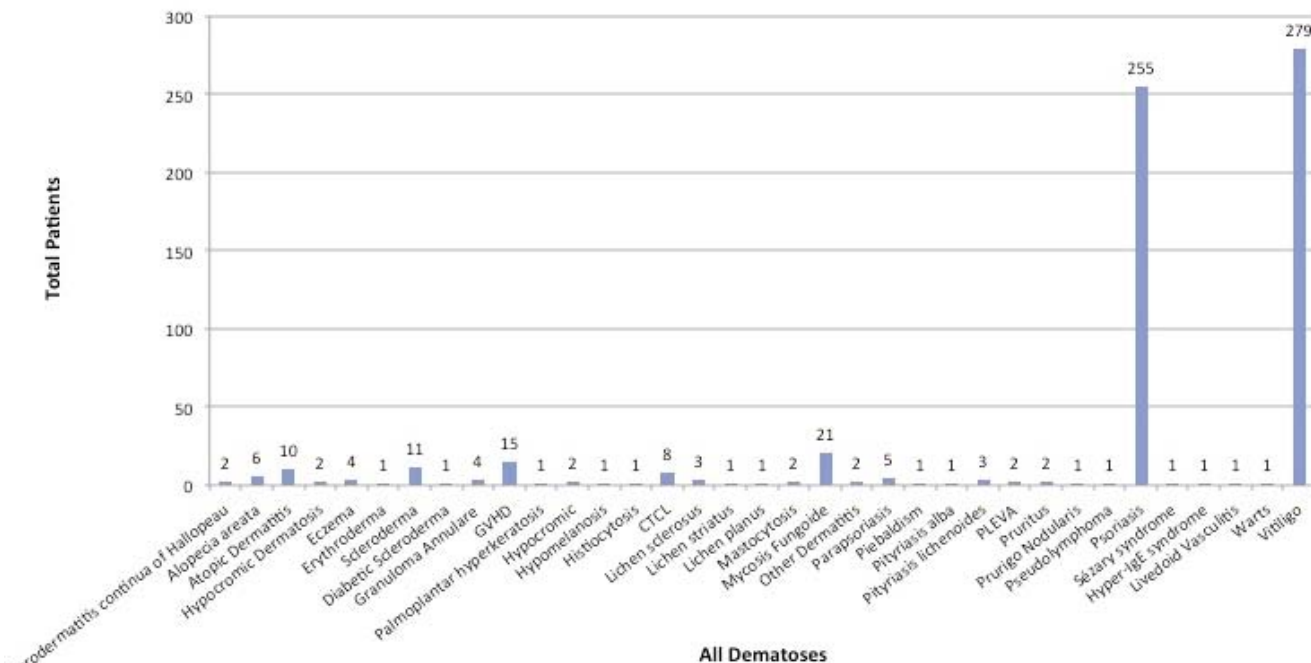
Nowadays, current studies are trying to refine the application of UV light, sparing areas that do not need treatment, thereby reducing the adverse effects of long-term use of phototherapy.<sup>3</sup> An example is the use of narrowband UVB since 1990, based on the principle that long wavelengths of UVB have greater therapeutic efficacy and are less erythematogenic than broadband. The 308-nm excimer laser, which was later developed, is a different spectrum of UVB that is focused on and directed to specific areas, with no need of exposing the entire body surface.<sup>2</sup>

Phototherapy is still mostly indicated for psoriasis. Patients with lesions that affect more than 20% of the body surface benefit from this kind of therapy. Narrowband UVB is more advantageous than broadband UVB, with resolution of the disease in up to 80% of cases.<sup>2,12</sup> Phototherapy is also commonly used to treat vitiligo when lesions affect more than 20% of the body surface, and narrowband UVB is recommended as the safest and most effective method.<sup>2,13</sup>

Treatment of dermatoses with phototherapy has been offered at the Dermatology Service of the Clinics Hospital of Porto Alegre (HCPA) for 14 years,



GRAPH 2: Distribution of phototype

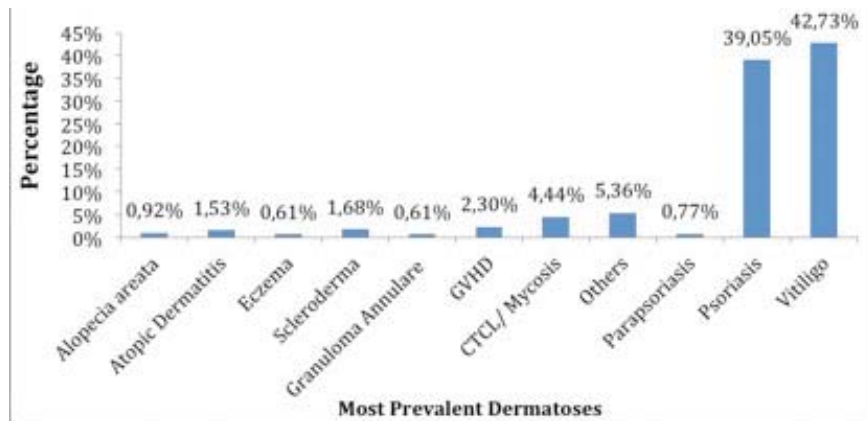


GRAPH 3: All dermatoses referred to the phototherapy unit

more recently including broadband UVB, PUVA, and narrowband UVB. Many patients have benefited from this treatment modality. However, there were no official data on the total number of patients treated or undergoing treatment at the Service, nor on their dermatological indications. In 2003, Kraemer et al. conducted a preliminary analysis of data on patients undergoing phototherapy in this institution. Among the patients allocated, 43.7% were subjected to phototherapy for vitiligo, and 42.2% underwent this treatment for psoriasis. Other dermatoses treated with phototherapy were not evaluated in this work. However, the main outcome examined in this study was the demographic data of patients undergoing phototherapy.<sup>8</sup> Although we did not find any other

studies that have larger data on the prevalence of dermatoses for which phototherapy is indicated, our findings are in accordance with these published data. Since vitiligo and psoriasis are the two most prevalent dermatoses in our analysis, we statistically evaluated the difference between them. The difference found in our analysis, according to which indication of phototherapy for vitiligo was more prevalent, was not statistically significant, but may represent a trend due to the higher current use of narrowband UVB phototherapy. This is because narrowband UVB phototherapy presents a better response and lower incidence of adverse effects in the long term among patients with vitiligo.<sup>2,13</sup>

This work is a pioneer study carried out at the



GRAPH 4: Most prevalent dermatoses referred to the phototherapy unit

Dermatology Service of the Clinics Hospital of Porto Alegre (HCPA), since there was no study evaluating which dermatoses are more often referred to the phototherapy unit, despite all the data available in the medical records of patients treated with phototherapy. Our study not only helps the Dermatology Service by indicating the number of patients already sent to this sector and demonstrating the importance of this treatment modality, but also by justifying the maintenance of this treatment modality in a public tertiary hospital and by showing the need for constant updates to follow the technological advances that have been seen in this area.

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## CONCLUSIONS

The use of phototherapy as a therapeutic modality in Dermatology is a good option nowadays. The study of the prevalence of the dermatoses referred to the phototherapy unit is important to evaluate the relevance of maintaining and updating this therapeutic modality. Our findings are in accordance with the literature, showing that, although phototherapy is still mostly indicated to treat psoriasis, it has been used to treat other dermatoses, since the results are promising. □

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