

Five Years of Practical Experience of Phototherapy Clinic in Dermatology Department - Tripoli Central Hospital

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Received 10 March 2013/Accepted 5 June 2013

ABSTRACT

Phototherapy is used to treat a variety of skin diseases. Different types of phototherapy are used in the treatment of skin conditions; primarily for psoriasis and vitiligo, for which phototherapy was first introduced. This cross sectional descriptive study of five year interval was conducted in a phototherapy clinic, dermatology department-Tripoli central hospital. The data was collected from files of the patients attending the clinic from December 2007 to December 2012. The collected data was packaged and analyzed by SPSS-version16. Descriptive statistic was used for age, sex, residency, marital state, occupation, skin type, diagnosis, treatment type and follow up. For inferential statistics, Chi square, and the Anova test were used. A *P*-value <0.005 was considered significant.

The total number of patients who attended the clinic was 1279. Of which the female patients were 57.6%, the male patients were 42.4% with the minimum age of 5 years, maximum of 87 years and mean age of 33 ± 15 . The most common skin type was type IV (98.4%). Most of the patients were resident in Tripoli (69.8%). The most common disease we treated was vitiligo (43%) followed by psoriasis (34.7%), progressive macular hypomelanosis (PMH) (8.7%), cutaneous T-cell lymphoma (CTCL) (3.8%), and pruritus (3.8%). Narrow band- ultraviolet B (NB-UVB) was the commonest treatment type used (83.8%) while systemic psoralen plus ultraviolet A (PUVA) was only (11.8%). Of the patients, 56.6% completed their treatment regularly, while (14.3%) were irregular, reported (2.6%) therapy failure and (26.5%) drop out. For NB-UVB the maximum number of sessions recorded was 199 sessions and the highest cumulative dose was 874 J/cm^2 . For systemic PUVA the maximum number of sessions was 188 sessions with 940 J/cm^2 as the highest cumulative dose.

The study concluded that, the indications and need for phototherapy are increasing and many skin diseases can be treated successfully with phototherapy without relevant complications. Therefore phototherapy should be easily accessible to all the patients. Also the study found the number of sessions, and cumulative doses (especially for NB-UVB) are related significantly to the diagnosis of the disease. Long term follow up needs to be conducted on patients exposed to phototherapy to establish whether there exists a correlation between the treatment, and possible side effects such as photo-aging, and development of cancer.

Keywords - Phototherapy; Narrow band UVB; Systemic PUVA.

INTRODUCTION

Phototherapy using artificial light sources has a tradition dating back more than 75 years. A combination of topical crude coal tar, and subsequent ultra violet (UV) irradiation for the treatment of psoriasis was introduced by Goeckerman in 1925. It became standard therapy for psoriasis for half a century particularly in the United States. In the 1970 it was observed that broad b, and ultraviolet B (UVB) radiation alone, if given in doses that produce a slight erythema could clear the milder forms of psoriasis. The introduction of PUVA (systemic psoralens + ultra violet A) in the mid-1970s sparked a whole new series of discoveries; including high intensity UV sources and selective spectra in the UVB and UVA range. In the mid-1980's, a major advancement was the development of florescent bulbs that emitted narrow band UVB radiation at 311-313 nm.¹The wavelength region of ultra violet radiation extends from 100 to 400 nm.

It is divided into UVC (100-280 nm), UVB (280-320 nm)

and UVA (320-400 nm).¹⁻⁵The therapeutic effect of UVA1 (340-400 nm) is related to the fact that its long wavelength penetrates the dermis more deeply than UVB, thus it is used in atopic dermatitis, morphea and keloid.⁶

Phototherapy is used to treat: psoriasis, pityriasis rubrapilaris, eczema, lichen planus, pityriasis lichenoides (acute and chronic), vitiligo, pruritus or prurigo, alopecia areata, generalized grauloma annulare, morphae, scleroderma, lichen sclerosis⁷⁻⁸, mycosis fungoides (stages IA, IB, IIA)⁹, solar urticaria, polymorphic light eruption (PLE), chronic actinic dermatitis, pityriasis rosea, chronic idiopathic urticaria, urticaria pigmentosum, mastocytosis, cutaneous graft versus host disease (GVHD), subcorneal pustular dermatoses^{3,10,11}, lymphomatoid papulosa and Langerhans cell histiocytosis.

Photo dynamic therapy (PDT) is effective in actinic keratoses on the face and scalp, Bowen's disease and superficial basal cell carcinomas (BCCs), areas where

there is potential beneficial effect include viral warts, acne, psoriasis and cutaneous T-cell lymphoma.¹²

It is thought that PUVA is associated with a dose-dependant increased risk of non melanoma skin cancers (photo carcinogenesis), but no increase has been documented with NB-UVB and long term data is lacking.^{1,10,13}

This study was conducted to find out the most common skin type in our patients, the different diseases we treated and the commonest treatment type required. The number of sessions, and cumulative doses for each treatment type will be also analyzed. The complications of four treatments and the follow up of our patients will as well be evaluated.

MATERIALS AND METHODS

Study design: Cross sectional descriptive study.

Study place: Phototherapy Clinic in Dermatology Department, Tripoli Central Hospital.

Study period: Dec. 2007 to Dec. 2012.

Study population: All medical records of patients attending the clinic for treatment.

Data management and analysis: The data which was drowning from medical records include: age of the patients, sex, marital state, their residency and occupations.

Data was packaged and analysed by the software program, SPSS. Mean, standard deviation and percentage were used for descriptive statistics; Chi square and Anova test were used for inferential statistics.

RESULTS

Total number of 1279 patients were treated with phototherapy in our clinic from December 2007, to December 2012. 57.6% were females, and 42.4% were males. With a minimum age of 5 years, maximum age of 87 years and mean age of 33 ± 15 . Skin phototype IV was the most common skin type (98.4%). 69.8% were resident in Tripoli and 30.2% were from the surrounding areas (Table 1 shows in more details the sociodemographic characters of the patients). The most common disease we treated was vitiligo (43%) (Figure 1), followed by psoriasis (34.7%) (Figure 2), progressive macular hypomelanism (PMH) (8.7%), CTCL (3.8%) (Figures 3 and 4), pruritus including nodular prurigo (3.8%), morphea and lichen sclerosis et atrophicus (1.5%), alopecia areata (1.1%), (3.4%) were with other diagnosis involving: palmoplantar eczema (Figure 5), subcorneal pustular dermatosis, pityriasis lichenoides chronica, lichen planus, mastocytosis and one case of chronic idiopathic urticaria. The most common treatment used was NB-UVB (83.8%) with very good compliance as 88% of the patients completed their treatment without complications (Figure 6). While (7.3%) developed erythema, (2.5%) complained of itching, (0.9%) developed folliculitis, headache (0.3%), claustrophobia (0.3%) and (0.6%) had provocation of their recurrent herpes simplex. Only 11.8% were treated with systemic PUVA, but the incidence of erythema and itching was more than with NB-UVB 17.8% and 3.7%, respectively (Figure 7). Although 71% had no complications, 7.5%

developed some rare complications [nausea and vomiting from psoralen, onycholysis and melanonychia]. Regarding the compliance of the patients and follow up, 56.6% of the patients completed their treatment regularly while 14.3% were irregular, we reported 2.6% therapy failure and 26.5% drop out (Table 2). For NB-UVB the maximum number of sessions recorded was 199 sessions, with the highest cumulative dose of 874 J/cm². For systemic PUVA, the maximum number of sessions was 188 sessions with 940 J/cm² as highest cumulative dose.

Table 1: Sociodemographic characters of the patients treated in phototherapy clinic-Tripoli Central Hospital.

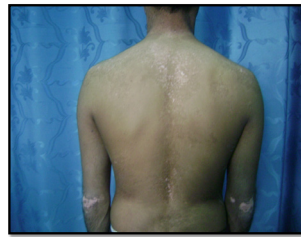
Character	Frequency	Percentage
Age group:		
Children (5 – 18 yrs)	187	14.6 %
Young adults (18 – 40 yrs)	714	55.7 %
Adults (41 – 65 yrs)	340	26.6 %
Elderly (> 65 yrs)	39	3.1 %
Sex:		
Male	543	42.4 %
Female	737	57.6 %
Marital state:		
Child	187	14.6 %
Single	555	43.4 %
Married	534	41.7 %
Divorced	3.0	0.2 %
Widow	1.0	0.1 %
Occupation:		
Student	313	24.5 %
Housewife	366	28.6 %
Employed	456	35.6 %
Free job	76	5.9 %
Retired	69	5.4 %
Residency:		
Inside Tripoli	894	69.8 %
Outside Tripoli	386	30.2 %

Table 2: Clinical profile of the patients treated in phototherapy clinic-Tripoli Central Hospital.

Character	Frequency	Percentage
Diagnosis:		
Psoriasis	444	34.7 %
Vitiligo	551	43.0 %
CTCL	49	3.8 %
PMH	111	8.7 %
Pruritus	48	3.8 %
Morphea and LSA	19	1.5 %
A.A	14	1.1 %
Others	44	3.4 %
Treatment type:		
NB-UVB	1073	83.8 %
Systemic PUVA	151	11.8 %
Bath PUVA	43	3.4 %
NB-UVB and PUVA	13	1.0 %
Follow up:		
Regular	631	56.6 %
Irregular	151	14.3 %
Therapy failure	29	2.6 %
Drop out	295	26.5 %



before



after

Figure 1: Vtiligo vulgaris treated with NB-UVB.

before



after

Figure 3: CTCL treated with NB-UVB.

before



after

Figure 2: Psoriasis vulgaris treated with NB-UVB.

before



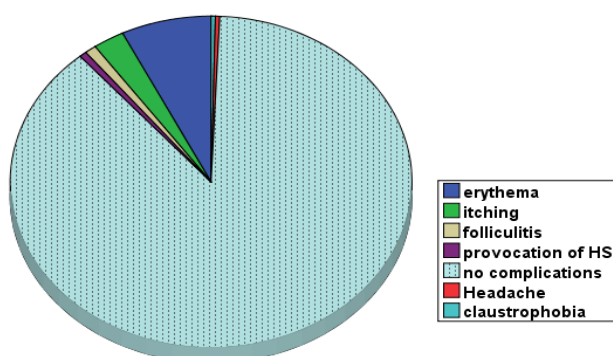
after

Figure 4: CTCL treated with systemic PUVA.

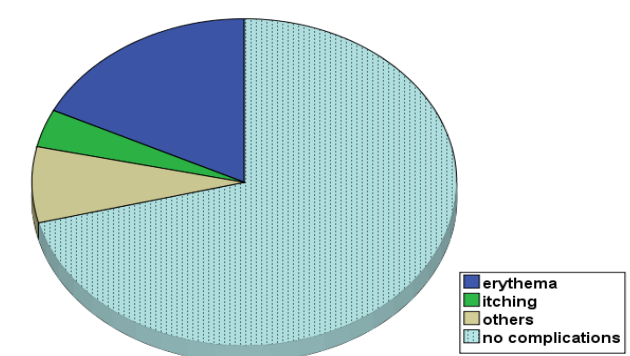
before



after

Figure 5: Hand-foot Eczema treated with bath-PUVA.

88%: no complications, 7.3%: erythema, 2.5%: itching

Figure 6: Complications of NB-UVB.

71%: no complicatio, 17.8%:erythema, 3.7%: itching

Figure 7: Complications of systemic PUVA.

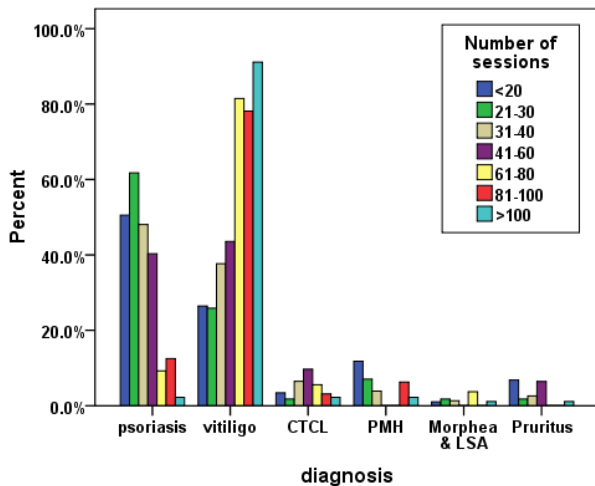


Figure 8: Relation between diagnosis and number of sessions for NB-UVB [P .value = 0.001].

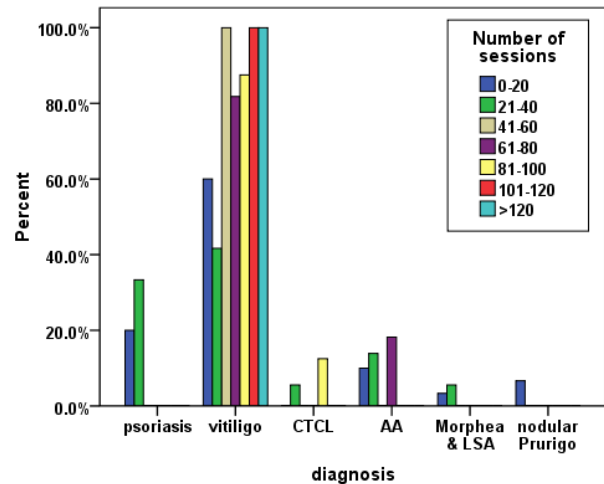


Figure 10: Relation between diagnosis and number of sessions for systemic PUVA [P .value = 0.142].

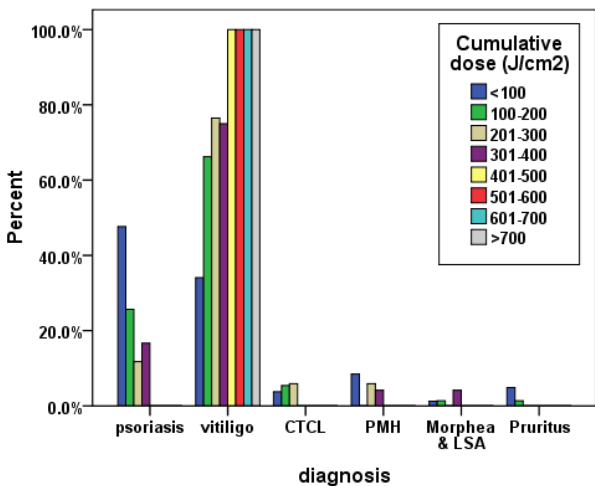


Figure 9: Relation between diagnosis and cumulative dose for NB-UVB [P .value = 0.001].

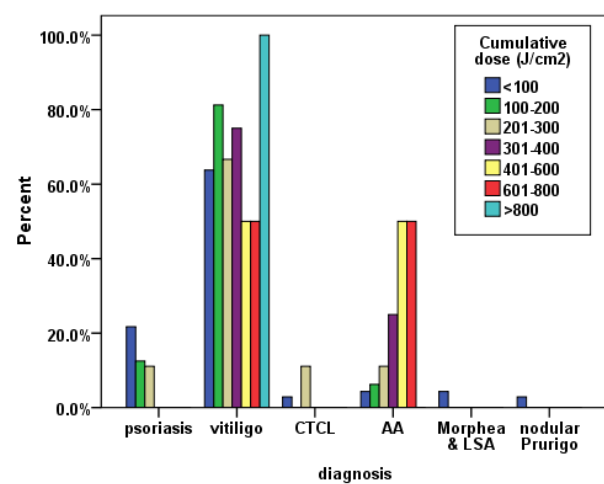


Figure 11: Relation between diagnosis and cumulative dose for systemic PUVA [P .value = 0.582].

DISCUSSION

Our phototherapy unit was opened in 2007. At that time we started with two standing cabinets, one lying machine [UVA + NB-UVB], one [UVA] hand-foot unit and one machine for local UVB. Since then we have treated 1279 patients with different diagnosis, standardized guide lines were followed in our clinic, some were modified according to our observations on our patients. Our patients are followed up clinically, as well as photographically [after verbal consent from the patient] at regular intervals according to their diagnosis. The most common disease treated was vitiligo, (77.6%) of the vitiligo patients were treated with NB-UVB while (18.9%) were treated with systemic PUVA. The patients who were treated with NB-UVB showed higher satisfactory rates due to increased repigmentation, less tanning and less side effect. A result which is concluded also in other studies. A randomized controlled study published by Sapam et al¹⁴, concluded that, NB-UVB carried a greater response rate, and might be superior to oral PUVA with better tolerance and color match with the surrounding normal skin; as well as fewer side effects in the treatment of vitiligo. Another open

prospective study published by Bhatnagar et al.¹⁵ also concluded that, NB-UVB performed better in comparison to TMP PUVA in terms of mean total repigmentation when traditionally considered therapy-resistant sites were excluded. The next most common disease we treated after vitiligo was psoriasis and NB-UVB was again used more frequently (89.4%) compared with systemic PUVA (4.7%). Due to the good clinical response, less side effects and less restrictions to NB-UVB [can be used in children, pregnant and lactating ladies] for patients with eye changes, with gastric or hepatic problems where psoralens can not be used; NB-UVB is a good option. The same conclusion of Beani JC and Jeanmougin M.¹⁶, Narrow-spectrum UVB phototherapy offers a good alternative to PUVA therapy since concomitant psoralen is not required, but there are few immediate adverse effects, there is less risk of drug-induced photosensitisation, and there is no need for skin or ocular photoprotection after sessions. Although our patients showed good compliance to the treatment and 56.6% completed their treatment regularly. We underwent a 26.5% drop out rate during our experiment, the majority

of which suffered from vitiligo. We discovered one of the major factors which contributed to this statistic was the journey the patients had to make into Tripoli, as 30.2% resided outside of the capital. Another key factor, included patients who developed unforeseen complications and symptoms due to other medical conditions such as uremic pruritus. Regarding our therapy failure rate of 2.6%, the patients of which were mainly vitiligo sufferers, and alopecia areata. They were treated with systemic PUVA, responding well initially with signs of hair growth at the early stages of treatment. However, as UVA is unable to penetrate grown hair, they quickly relapsed as the therapy became ineffective. We have observed that the number of sessions (Figure 8), as well as the cumulative doses of treatment (Figure 9) are strongly related to the diagnosis of the patient in case of NB-UVB (P -value = 0.001). In both cases owing to the different starting doses, and percent of increment of the dose in each disease; while they are not significantly related to the diagnosis in case of systemic PUVA (P -value was insignificant) (Figures 10 and 11).

CONCLUSION

-The indications and need for phototherapy are increasing with time and many skin diseases can be treated successfully with phototherapy without relevant complications.

-The number of sessions and cumulative doses (especially for NB-UVB) are related significantly to the diagnosis of the disease.

RECOMMENDATIONS

-Due of the increasing need for phototherapy, it should be made more easily accessible for all patients in our cities to overcome the drop out rate that we had experienced. It should be made available in polyclinics instead of its limited availability in only big centres.

-Cooperation between the phototherapy clinics in different dermatological departments in Libya is needed for moral motivation, furthermore to share experience. Also to enable us collectively, to reach a national estimate for the minimal erythema dose [MED], and minimal phototoxic dose [MPD]. Upon which our dosage will depend, hence to put our own standardized protocols for Libyan patients.

-Photo aging and cancer development, in relation to phototherapy need long term follow up investigations to be able to reach a valid conclusion concerning the safety of phototherapy.

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