

Acknowledgment

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List of abbreviations

Er: YAG	Erbium- yttrium- aluminium- garnet
FLPDL	Flashlamp- pumped pulsed dye laser
UVB	Ultra violet B (between 290-320 nm)
PUVA	Psoralens and ultraviolet A (320-400nm)
BB-UVB	Broad band ultraviolet B (290-320)
NB-UVB	Narrow band ultraviolet B (311-313)
IFR	Infra red radiation
PDT	Photodynamic therapy
Q- Switched	Quality- switched
ALA	Aminolevulinic acid
MAL	Methyl Aminolevulinic acid
CD	Cluster differentiation
IL	Interleukin
IFN- γ	Interferon gamma
TNF	Tumour necrosis factor
HLA	Human leucocytes antigen
ICAM-1	Intercellular adhesion molecule -1
PWSs	Port-wine stains
D-E junction	Dermoepidermal- junction
T _i	The initial temperature
T _f	The reduced temperature
PASI	Psoriasis area severity index
PSI	Psoriasis severity index
B. Vs	Blood vessels

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ABSTRACT

Psoriasis is a chronic disease characterized by inflammation and keratinocytes proliferation. It affects 1-3% of population and the incidence is equal in males and females.

In the year 2008, 685 patients were found to be affected with psoriasis out of 64684 who attended Khartoum Dermatology Teaching Hospital. The incidence was 1.06%.

Psoriasis has presents a therapeutic challenge to physicians specially the chronic plaque psoriasis resistant to conventional methods of treatment.

This study showed that the use of standard flashlamp pulsed dye laser (FLPDL) with epidermal cooling in the treatment of chronic plaque psoriasis was effective and could be used as an alternative therapy in patients not responding to other types of treatment.

Photodynamic therapy can be used as an alternative laser therapy for chronic plaque psoriasis if pulsed dye laser is not available.

Till now there are no documented studies about using FLPDL and photodynamic therapy in treating chronic plaque psoriasis in Sudan,

So in this study we used FLPDL and photodynamic therapy as alternative modalities to clear psoriatic plaques, to improve the cosmetic appearance of patients and decrease their psychological trauma.

The standard FLPDL is considered now an important way of treating resistant chronic plaque psoriasis. The wavelength of this laser is 595nm, and the pulse duration is 0.45mes. The mode of action depends on the theory of selective photothermolysis to cause thermal coagulation of the dilated papillary dermal vasculature, preventing the access of activated T lymphocytes to reach the skin.

The standard FLPDL systems are usually associated with epidermal cooling techniques to prevent non-selective thermal damage of the epidermis.

Study design: This is a fractional experimental study, testing the effects of FLPDL and the photodynamic therapy with different parameters on chronic plaque psoriasis.

Study area: This study was conducted in Laser Institute, Sudan University, plastic surgery department in Khartoum Teaching Hospital, and Khartoum Dermatology Teaching hospital, during the period from June 2009 to August 2010

Objective: The general objective of this study is to test the effect of FLPDL and photodynamic therapy on chronic plaque psoriasis in Sudanese patients and compare the result with topical conventional PUVA therapy, while the specific objective is to evaluate the clinical and histological response of treating chronic plaque psoriasis in Sudanese patients

Subject, Materials and method: The laser medical system used in this study was the FLPDL with a dynamic cooling device while the laser medical system used for photodynamic system were continuous diode lasers with different wavelengths and output power to activate the chemical photosensitiser

(Topical 20%- Aminolevulinic acid hydrochloride solution).

For topical PUVA therapy we used methxsalen 0.2% solution as a photosensitiser which was activated by long wavelength ultraviolet radiation (UVA)

35 patients with chronic plaque psoriasis were included in this study.

24 patients were treated with photodynamic therapy, 3 patients treated with FLPDL, and 8 patients treated with topical PUVA therapy. Some patients were treated in the Institute of laser, Sudan University; others

were treated in plastic surgery department in Khartoum Teaching Hospital, during the period between June 2009 to August 2010

Before starting laser therapy, the usual laser safety precautions were checked, especially the eye goggles for the medical staff and the eye shields for the patients.

For FLPDL the desired fluence was adjusted as follows:

10J/cm² for plaque A

10.5 J/cm² for plaque B

11 J/cm² for plaque C

The dynamic cooling device was 30ms with 10ms delay

For photodynamic therapy, 4 patients received 542nm diode laser radiation, 4 mW output power for 15 minutes. Another 4 patients received 657nm diode laser radiation, 16 mW for 15 minutes. Out of the last 12 patient's, 4 patients received 671 diode laser radiation , 50mW output power for 15 minutes, 4 patients received 671nm diode laser, 100mW power for 10 minutes, 8 patients received 671 diode laser radiation, 100mW output power diode laser radiation for 15 minutes.

Results and Discussion: This study showed that chronic plaque psoriasis responded to the treatment by the pulsed dye laser, 67% of patients with chronic plaque psoriasis achieved complete clearance of their lesions, 33% achieved 50% reduction in PSI. None of the patients showed no or poor response after flashlamp pulsed dye laser (595nmFLPDL) therapy.

For photodynamic therapy, 17% achieved complete clearance, 12% achieved 75% reduction in PSI, and 46% achieved 50% reduction in PSI. 17% achieved 25% reduction in PSI, and 8% showed no response.

Treatment of chronic plaque psoriasis by the conventional method was either ineffective or achieved poor results in chronic plaque psoriasis

Conclusion and Recommendation:

The use of FLPDL with epidermal cooling is an effective method of treating chronic plaque psoriasis, and should be considered in patients not responding to other types of therapy

Photodynamic therapy gave variable results and needs further research work

Topical PUVA therapy should not be considered in the treatment of chronic plaque psoriasis, because it gave poor results.

This study offers a basic study for further studies dealing with treating chronic plaque psoriasis with FLPDL and photodynamic therapy.

The Laser clinic in Khartoum Dermatology Teaching Hospital should be supplied with more appropriate modern equipments and trained doctors and technologist

Coordination between the laser clinic and other clinics especially the plastic surgery clinics in the country

Further studies using laser in the treatment of chronic plaque psoriasis are mandatory.

المستخلص

الصدفية مرض مزمن يتصف بالتهابات الجلد ونمو خلايا النسيج الضام فى الادمة نتيجة للاندقسام الخلوى السريع، تصيب حوالى 1-3% من البشر وتصيب الذكور والاناث على حد سواء.

فى سنة 2008 تم احصاء 685 حالة بمستشفى الجلدية بالخرطوم من مجمل عدد المرضى البالغ 64684 .

النسبة المئوية لمرضى الصدفية من المجموع الكلي للامراض تساوي 1,06% .

علاج الصدفية يمثل تحديا دائما لأطباء الجلد خاصة الحطاطات المزمنة المقاومة للعلاجات التقليدية المعروفة. هذه الدراسة أظهرت أن استخدام ليزر الصبغة النبضية هو علاج فعال و ناجح و يمكن استخدامه كبديل للعلاجات الاخرى فى علاج الصدفية المزمنة ذات الحطاطات المحدودة المقاومة للعلاج، العلاج بالفوتوداينمك أعطى نتائج متباينة ويمكن استخدامه فى حال عدم وجود ليزر الصبغة النبضية ولان لا توجد دراسة موثقة فى السودان لاستخدام ليزر الصبغة النبضية أوفوتوداينمك فى علاج الصدفية. وتعتبر هذه الدراسة تجربة جزئية لمعرفة اثر العلاج بليزر الصبغة النبضية والفوتوداينمك (المعالجة الضوئية الكيميائية) فى حطاطات الصدفية المزمنة المحدودة الشديدة الظهور ذات الحدود الواضحة.

مكان الدراسة

تمت هذه الدراسة بمستشفى الجلدية الخرطوم و قسم جراحة التجميل بمستشفى الخرطوم ومعهد الليزر بجامعة السودان فى الفترة من يونيو عام 2009 حتى اغسطس من عام 2010.

أهداف الدراسة

الهدف العام من هذه الدراسة هو اختبار فعالية ليزر الصبغة النبضية والفوتوداينمك فى علاج الحطاطات الشديدة المزمنة ومقارنة النتائج مع العلاج الموضعى التقليدى باستعمال الميثوسالين والاشعة فوق البنفسجية الطويلة A، اما الهدف الخاص فهو التقييم الاكلينيكى والهستولوجى بعد المعالجة بليزر الصبغة النبضية والفوتوداينمك ومقارنته بالعلاج الموضعى التقليدى.

المرضى والطرق المتبعة فى الدراسة

تمت هذه الدراسة وسط المرضى المترددين على مستشفى الجلدية والتناسلية بالخرطوم .
تمت دراسة 35 مريض مصابون بداء الصدفية المزمن المحدود .
24 مريض تلقوا العلاج بالفوتوداينمك ، 3 مرضى تلقوا الاعلاج بليزر الصبغة
النبضية ، و 8 مرضى تم علاجهم بالعلاج الموضعى التقليدى .
الفحص الطبى على جميع المرضى تم بالعيادة الخارجية لمستشفى الجلدية و قد اعتمد
التشخيص على الاعراض الاكلينيكية لكل المرضى . تم فحص الانسجة المريضة قبل
وبعد العلاج لعدد 2 من المرضى من جملة 3 مرضى تم علاجهم بليزر الصبغة النبضية ،
و 4 مرضى من جملة 24 مريض تم علاجهم بالفوتوداينمك ، و 2 مرضى من جملة 8
مرضى تم علاجهم بالعلاج الموضعى التقليدى .

اجهزة الليزر التى استخدمت فى هذه الدراسة هى ليزر الصبغة النبضية المزود بجهاز
تبريد ، وليزر الدايدو المستمر باطوال موجية مختلفة و قوة اشعاعية مختلفة . استخدم ليزر
الدايدو لتنشيط مادة الاماينوليفبولنك اسد الذى وضع على حطاطات الصدفية مدة
ساعتين ويسمى هذا العلاج بالفوتوداينمك .

بالنسبة للعلاج الموضعى التقليدى استخدمت مادة ميثوكسلين التى وضعت على
الحطاطات مدة ساعة ثم عولجت بالاشعة فوق البنفسجية الطويلة A .
قبل بدء العلاج بالليزر تمت مراجعة احتياطات السلامة خاصة نظارات العيون الواقية
للتيم المعالج والمرضى . تم بعد ذلك ادخال الاطوال الموجية وكثافة الاشعاع المختلفة
لكل مريض مترامدة مع تجهيز عمل جهاز التبريد الخاص بليزر الصبغة النبضية .

النتائج

أظهرت النتائج فى هذه الدراسة ان حطاطات الصدفية المزمنة استجابت بشكل جيد
للعلاج بليزر الصبغة النبضية . 67% من المرضى المصابين استجابوا بطريقه كاملة
واختفت الحطاطات تماما بعد 3 اشهر من اخر جلسه ليزر و 33% خفضت مظاهر المرض
عندهم بنسبه 50% .

أظهرت الاستجابة للعلاج بالفوتوداينمك ما بين ضعيفه و متوسطه و استجابته كامله
وذلك تبعا لكثافة الطاقه المستعملة . 17% من المرضى استجابوا بطريقه كاملة 12%
خفضت مظاهر المرض عندهم بنسبه 75% ، 46% خفضت مظاهر المرض بنسبه 46% ،
17% خفضت بنسب 25% ، و 8% لم يستجيبوا للعلاج .

استجابة الحطاطات للعلاج الموضعى التقليدى باستخدام الميسوكسالين والاشعه فوق
البنفسجية كانت إما ضعيفه 25% او لاتوجد استجابته .

الخلاصة

استخدام ليزر الصبغة النبضية فى علاج حطاطات الصدفية المزمنة المحدوده يمكن ان يكون احد البدائل الناجحه فى علاج هذا النوع من الصدفية. الفوتوداينمك اعطى نتائج متباينه , ويحتاج هذا النوع من العلاج الى مزيد من الدراسة والمتابعة. هذه الدراسة يمكن ان تكون دراسة اولية لعلاج الصدفية بليزر الصبغه والفوتوداينمك ويمكن ان تشكل اساس لدراسات اضافية لهذا النوع من العلاج.

التوصيات :

تطوير قسم الليزر بمستشفى الجلدية وتزويده بمعدات إضافية واطباء وفنيين مدربين تدريب على فى استخدام الليزر فى مختلف امراض الجلدية. التنسيق والتعاون فى مجال العلاج بالليزر بين مستشفى الجلدية والعيادات الاخرى مثل جراحة التجميل والاورام والاطفال وغيرهم. الالتحاق بمعهد الليزر لمزيد من الدراسات فى استخدام الليزر لعلاج الصدفية المزمنة المحدوده. انشاء ارشيف لحفظ ملفات المرضى مع التأكد من ملء الملفات وكذلك مكتبة لحفظ صور من الرسائل العلمية وارشفتها.