

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Sudan University of Science & Technology

College of Postgraduates Studies

Institute of Laser

The effect of Low Level Laser Therapy in

Treatment of Pityriasis versicolor

A dissertation submitted for partial fulfillment of the
requirements for the degree of postgraduate diploma
of laser applications in medicine

By

Dr. Bushra Ismail Osman Ali

Consultant Dermatologist

Supervisors

Dr. Babikir Osman El Bashier

PhD of Laser physics

Dr. Mahasin Mohamed Belo

Consultant Dermatologist

March 2011

ABSTRACT

Pityriasis versicolor is a chronic skin infection caused by *Malassezia* yeast. The patients presented mainly with itching and psychological upset from its cosmetically unaccepted appearance.

The aim of this study was to determine that low level laser therapy (diode laser) is effective treatment of pityriasis versicolor with less or without any side effects.

Six patients with pityriasis versicolor, all were males aged 23-68 years, were selected randomly.

Low level diode laser (Omega XP) was used with cluster probe 46, multipulse mode, exposure time 3 minutes/area which was 10-15 cm in diameter, fluence 14.4 J/cm² and repetition rate of 1, 5 & 10 KHZ.

Photographs were taken prior and after treatment. The operating dermatologist and the patients evaluated the effect of treatment.

This study revealed that low level laser therapy provided relief from itching following few sessions in most of the patients and by the end of the study all the patients were free from itching and scales.

This study concluded that the LLLT (diode laser) is efficient and safe in the treatment of pityriasis versicolor.

ملخص الدراسة

النخالة المبرقشة هي مرض جلدي مزمن تسببه خميرة المالايسيزيا ويؤدي الي حكة بالإضافة للضغط النفسي الناتج عن مظهره المنفر.

الهدف من هذه الدراسة معرفة مدى فاعلية الليزر منخفض القدرة في علاج النخالة المبرقشة بدون آثار جانبية.

أخذت المجموعة بطريقة عشوائية و هي تتكون من ستة مرضى كلهم ذكور و قد تم تعريضهم لليزر عن طريق المسبار العنقودي لمدة 3 دقائق لكل مساحة والتي قطرها 10-15 سم بكثافة طاقة قدرها 14.4 جول/سم² ونبض متعدد بترددات 1-5-10 كيلو هيرتز.

تم أخذ الصور الفوتوغرافية قبل و بعد العلاج كما تم تقييم النتيجة بواسطة الطبيب المعالج و المرضى و ذلك باختفاء الحكة و القشور.

خلاصة الدراسة هي أن فاعلية الليزر منخفض القدرة في علاج النخالة المبرقشة تعتبر جيدة إذ أنها أفضت إلى زوال الحكة والقشرة بدون أية آثار جانبية.

CONTENTS

DEDICATION	I
ACKNOWLEDGMENT	II
LIST OF TABLES	III
LIST OF FIGURES	IV
ABSTRACT	V
ABSTRACT IN ARABIC	VI
ABBREVIATIONS	VII
CONTENTS	VIII
CHAPTER ONE: BASIC CONCEPTS AND LITERATURE REVIEW	1
INTRODUCTION	1
1.1 ANATOMY OF THE SKIN	1
1.1.1 THE EPIDERMIS	1
1.1.2 DERMIS	4
1.2 FUNCTIONS OF THE SKIN	5
1.3 PITYRIASIS VERSICOLOR	7
1.3.1 ETIOLOGY	7
1.3.2 HISTOLOGY AND PATHOGENESIS	8
1.3.3 CLINICAL FEATURES	9
1.3.4 DIFERENTIAL DIAGNOSIS	9
1.3.5 DIAGNOSIS	9
1.3.6 TREATMENT	10
1.4 LASER IN DERMATOLOGY	10
1.4.1 HISTORY OF LASER	11
1.4.2 PROPERTIES OF LASER LIGHT	11

1.4.3 LASER MECHANISM	12
1.4.4 TREATMENT BY LASER	13
1.4.5 CONTINUOUS AND PULSED LASERS	14
1.4.6 SAFTY OF LASERS IN DERMATOLOGY	14
1.4.7 TYPES OF LASER	17
1.4.8 LASER-TISSUE INTERACTION	17
1.4.9 A BRIEF BACKGROUND OF LOW LEVEL LASER THERAPY	19
1.5 LITERATURE REVIEW	23
1.6 OBJECTIVE OF THE STUDY	26
CHAPTER TWO: MATERIALS AND METHODS	27
2.1 MATERIALS	27
2.1.1 STUDY AREA AND DURATION	27
2.1.2 STUDY DESIGN	27
2.1.3 STUDY POPULATION	27
2.1.4 ETHICAL CONSIDERATIONS	28
2.1.5 PATENTS RECORDS	28
2.1.6 THE LASER MEDICAL SYSTEM	28
2.1.7 DEVICE DESCRIPTION	28
2.1.8 SAFTY PRESAUTIONS OF LLLT (OMEGA XP)	30
2.2 METHODS	30
2.2.1 STEPS OF LASER OPERATION	30
2.2.2 PREVENTATION OF CROSS INFECTION	30
2.3 DATA ANALYSIS	30
CHAPTER THREE: RESULTS AND DISCUSSION	31
3.1 INTRODUCTION	31
3.1.1 AGES	31
3.1.2 SEX	31

3.1.3 OCCUPATION	31
3.1.4 DURATION	32
3.1.5 SITES	32
3.1.6 LEADING PRESENTAGE SYMPTOMS	33
3.1.7 PRESENTING SYMPTOMS	33
3.1.8 FAMILY HISTORY OF SIMILAR CONDITION	34
3.1.9 HISTORY OF PREVIOUS TREATMENT	34
3.2 RESULTS	35
3.2.1 ITCHING DISAPPEARANCE	35
3.2.2 SCALES DISAPPEARANCE	35
3.3 DISCUSSION	40
3.4 CONCLUSION	40
3.5 RECOMMENDATIONS	41
REFERENCES	42
APPENDIX 1.	44
APPENDIX 2.	45