

Dedication

To my family

Appreciation

I express my great thanks and tributes to every one who offered a help to me and did favor which lead of this work.

Full regards to my supervisor Dr Osman Mustafa who offered advices and ideas, in such a way that he motivated me to complete this work. Special thanks to the family of Alssafa Physiotherapy Center and to the medical physics department in Radiation and Isotopes Center of Khartoum (RICK) for their co operation and help .

Abstract

The use of infrared radiation in physiotherapy plays a very important role to relieve pain by increasing blood flow through tissues and remove waste products from the targeted area, if it is used in scientific manner for example the time of duration for exposure as it recommended is 15 to 20 minutes and reach's 30 minutes in some chronic cases. Also the distance between the source and the skin surface is in the range of 60cm_s to 90cm_s,for chronic and acute conditions respectively.

On the other hand the lamp used to produce infrared radiation must be prepared in a certain specifications e.g. it is power density and it is efficiency must be known .

By using digital thermometer to measure the temperature and using a measuring tape to measure the distance between the source and the skin surface so as to confirm the variation in the factors mentioned above. The researcher assumes that the source emission is 250 watt as it written on the lamp for chronic cases ,the standard distance is 60 cm and for acute cases is 90 cm while the standard time for both is 20 minutes.

The real doses given are different from session to session. Some of them are under dosed and others over dosed. The researcher worked out the optimum doses at specified times and distances above and tabulated his findings. He recommended standard values to proper treatment of acute and chronic

c a s e s .

ملخص

إن استخدام الأشعة تحت الحمراء في العلاج الطبيعي يلعب دورا هاما جدا في تخفيف الألم بزيادة جريان الدم خلال الأنسجة و إزالة نواتج الفضلات في المنطقة المستهدفة، إذا استخدم بالأسلوب العلمي الصحيح. مثلا مدة زمن التعرض الموصى بها هي من 15 إلى 20 دقيقة وقد تمتد إلى 30 دقيقة في بعض الحالات المزمنة. كما إن المسافة بين المصدر و سطح الجلد في المدى من 60 إلى 90 سم.

من ناحية أخرى فإن اللمبة التي تستعمل لإنتاج الأشعة تحت الحمراء يجب أن تتميز بخصائص محددة و معروفة كشدة طاقتها وكفاءتها.

أجريت هذه الدراسة في قسم العلاج الطبيعي بمستشفى الصفا التخصصي في الفترة من يناير حتى أغسطس 2006.

وباستعمال الثيرمو متر الرقمي لقياس درجة الحرارة وباستعمال شريط القياس لقياس المسافة بين المصدر (عبارة عن ثلاث لمبات أشعة تحت حمراء) و سطح الجلد ثم إثبات الاختلافات في العوامل المذكورة أعلاه.

الباحث افترض في هذا البحث إن القدرة هي 250 واط كما هو مكتوب على اللمبة للحالات المزمنة فإن المسافة القياسية هي 60 سم و للحالات الحادة فإن المسافة القياسية هي 90 سم بينما الزمن القياسي 20 دقيقة لكل.

إن الجرعات التي أعطيت فعلا اختلفت من جلسة لأخرى ففي البعض اقل من الجرعة القياسية في البعض الآخر أعلى من الجرعة القياسية.

و قد أعطى الباحث توصيات محددة لتلافى الخلل بهذه الوسيلة التي تستعمل بصورة مكثفة في أقسام العلاج الطبيعي .

الباحث عمل على حساب الجرعات المثلى على الأزمنة والمسافات الموضحة أعلاه ووضع جدولته لهذه الحسابات بتسجيل قيم الجرعات المثلى لعلاج الحالات الحادة والمزمنة .

Abbreviations

EM	Electromagnetic radiation
EMF	Electromagnetic radiation field
Hz	Hertz
ELF	Extremely low frequency
VHF	Very High Frequency
UHF	Ultra High Frequency
J/s	Joule per second
m/s	Meter per second
RF	Radiofrequency
IR	Infrared Radiation
UV	Ultraviolet
°C	Degree centigrade
eV	electron Volt
GHz	Gigahertz
m	meter
W/m²	Watt per meter square
nm	nanometer
RPA	Radiation Protection Agency

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