



Sudan University of Science and Technology
College of Graduate Studies



Evaluation of Radiation dose of upper
limbs x-ray examination in adults

تقييم الجرعه الإشعاعية للبالغين للأطراف العلوية عند التصوير الإشعاعي

thesis submitted in partial fulfillment for the requirements

Of Master degree in Medical Physics

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

(سورة البقرة 32)

Dedication

To my parents

My brothers

My sisters

TO everyone whom

Gave me a bit of

wise and advice.

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Abbreviations

ESD Entrance skin dose .
Ap Anterior posterior.
Kvp Kilo voltage peak.
CR Computed Radiography
FSD Focus skine distance.

Abstract

This Study was performed to evaluate radiation Entrance skin dose ESD for adults patients undergoing X-ray examination for upper limbs imaging, in two selected centers in and out Khartoum state which use Computed Radiography (CR) unit. The exposure parameters (kV, mAs and FSD) were chosen for each age category of adult from 20-70 years , then the ESD was calculated –by using the Microsoft caldose - for each category in the two hospitals and compared with the reference dose level. In center A the ESD for the upper limbs at the ages ((20-40), (40-60)) years found to be(0.54,0.47) μ Gy and In center B the ESD for the upper limbs the ages ((30-45),(45-60),(60-70)) years was (0.15,0.31,0.55) μ Gy. The final results showed that The ESD depends and changes with the exposure parameters (KV ,mAs) and changes with age. The ESD in the two centers is within the reference level and , also Variations were observed in ESD values among hospitals under study. From this study we recommended that for all x-ray equipment should be regular maintenance and quality control tests and to standardize the exposure parameters in adults imaging

مستخلص البحث

أجريت هذه الدراسة لحساب الجرعه الداخلة للمرضى البالغين الذين يخضعون لفحص التصوير الاشعاعى للاطراف العلويه ف مركزين داخل وخارج ولايه الخرطوم وقد تم اختيار عوامل التعرض ((المسافه بين السطح والجهاز ومضروب التيارف الزمن والجهد بالكيلوفولت)(kv,mAs,FSD)) لكل فئه عمريه ما بين 20-70 سنه ثم حساب الجرعه الداخله للجلد عن طريق برنامج مايكروسوفت caldose لكل فئه عمريه ف كل مستشفى، ف المركز (أ) وجد أن الجرعه الداخله للاطراف العلويه ف الاعمار ((40-20),(60-40)) سنه ((0.54,0.47)) μGy ، وف المركز (ب) وجد أن الجرعه الداخله للجلد للاطراف العلويه ف الاعمار ((70-60),(60-45),(45-30)) سنه ((0.15,0.31,0.55)) μGy ووجد أن الجرعه الداخله للجلد تتناسب طرديا مع الجهد ومضروب التيار والمسافه بين السطح والجهاز وكذلك تزيد مع العمر كما قورنت هذه النتائج مع بعض القيم المرجعيه ووجد ان الجرعه الداخله للجلد ف هذه الدراسه لاتتعدى القيم المرجعيه،من خلال هذه الدراسه نوصى بالقيام بالمزيد من الدراسات حول تقليل الجرعات الاشعاعيه وتوحيد عوامل التعريض والقيام باختبارات دوريه لضبط الجوده.

Chapter One

Introduction

