

قال تعالى :

﴿ شَهِدَ اللَّهُ أَنَّهُ لَا إِلَهَ إِلَّا هُوَ وَالْمَلَائِكَةُ وَأُولُو الْعِلْمِ قَائِمًا بِالْقِسْطِ ۚ لَا إِلَهَ إِلَّا ۚ﴾

هُوَ الْعَزِيزُ الْحَكِيمُ ﴿﴾

﴿ ١٨ ﴾ سورة آل عمران الآية ﴿ ١٨ ﴾

Dedication

To doses of the cup blank to give me a drop of love

To those of the fingers to give us a moment of happiness

To reap the thorns out of my way for me to pave the way

science

To heart the great my father

Of whom breastfed of love and healing balm

To the heart as pure whiteness my parents

To my friends , and to all my family

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Abstract

The assessment of image quality and patient dose from computed radiography for common x-ray examinations namely skull Posterior Anterior and Lateral , chest Posterior Anterior , lumber spine Anterior Posterior and Lateral and pelvis Anterior Posterior radiography was performed in three private hospitals in capital Khartoum . image quality evaluated by using threshold contrast-detail phantom (TO. 20). Assessment obtained by average scores from four specialist .

This study deals with evaluation of patient dose received by patients undergoing radiological examinations , Three large hospitals in Khartoum were selected and 164 patients made up the sample .The entrance surface doses (ESDs) to patient undertaking four common x.ray examination (skull PA& LAT , chest PA , lumber spine AP & LAT, pelvis AP) were estimated using ionization chamber for air kerma measurements . Exposure settings and patients data were recorded . Result concerning the kilovoltage (KVp) and tube current (mAs) and focus to film distance (FFD) settings . and the ESD values were analyzed and compared (by other hospitals) to those recommended by the EU . discrepancies in the patient doses and techniques used for the examinations studied were found among the different hospitals denoting the importance of establishing a national quality assurance programme and examination protocols to ensure patient doses are Kept as Low as possible . All the examinations studied fulfilled the EU recommendations .

The result of image quality show small different between three hospitals which indicate the routine quality assurance and quality control play important role in the equipment performance.

ملخص البحث

تقييم جودة الصورة والجرعة الإشعاعية في التصوير الرقمي لاختبارات الأشعة السينية الشائعة وهي الرأس (خلفي امامي و جانبي) والصدر (خلفي امامي) والعمود الفقري (امامي خلفي و جانبي) والحوض (امامي خلفي) ، وتم جمع البيانات من ثلاث مستشفيات كبرى في العاصمة الخرطوم .

قيمت جودة الصورة باستخدام عتبة تباين التفاصيل عن (TO.20 phantom) وحصلنا علي النتائج عن طريق متوسط الدرجات من اربعة مختصين .

تهدف هذه الدراسة لتقييم الجرعة الإشعاعية التي يتلقاها المريض اثناء التصوير الإشعاعي ، تم اختيار ثلاث مستشفيات كبرى في الخرطوم وقد تكونت العينة من 164 مريض ، و تم خلالها حساب مقدار الجرعة السطحية للمرضي الذين خضعوا لاختبارات الرأس والصدر والعمود الفقري والحوض باستخدام غرفة التأين لقياس كمية التعرض في الهواء ، ومن ثم تم تسجيل كمية التعرض وبيانات المرضي حيث اهتمت النتائج بمقدار جهد الانبوب و تيار الانبوب و المسافة ما بين البؤره والفلم لحساب قيم الجرعه السطحيه حيث تم تحليل النتائج ومقارنتها بتوصيات الإتحاد الاوربي .

وجد ان هنالك اختلاف في الجرعات بين المستشفيات الثلاث واختلاف الوضعيات اثناء التصوير ، مما يدل علي اهمية انشاء برنامج قومي لضمان الجودة وضرورة اتباع البرتوكولات العالمية للتأكد من ان جرعات المرضي عند أدني مستوي ممكن .

كما اوضحت نتائج جودة الصورة وجود اختلافات طفيفه بين المراكز الثلاث حيث وجد ان جودة التصوير في بعض منها افضل مما يدل علي ان الاهتمام باجراء فحوصات ضبط وتأكيد الجودة النوعية بشكل دوري له اهمية كبرى في اداء الأجهزة .

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List of abbreviation

CR	Computed Radiography
DR	Digital Radiography
PSP	Photostimulable phosphor
IP	Imaging plate
MTF	Modulation Transfer Function
FS	Film Screen
AP	Anterior posterior
PA	Poster anterior
LAT	Lateral
NPS	Noise Power Spectrum
CNR	Contrast-to-Noise Ratio
SNR	Signal-to-Noise Ratio
DQE	Detective Quantum Efficiency
FAXIL	Facility for Assessment of x.ray Imaging Leeds
TCDD	Threshold Contrast Detail Detestability
TFT	Thin Film Transistor
TLD	Thermolumescence Detector
MED	Medical Exposure Directive (97/43/Euratom)
QC	Quality Control
QA	Quality Assurance
PMT	Photomultiplier tube
ESAK	Entrance Surface Air Kirma
ESD	Entrance Surface Dose
FSD	Film Skin Dose
ALARA	As Low As Reasonable Achievable
ICRP	International Commission on Radiological Protection
NRPB	National Radiation Protection Board
KUB	Kidney – Urethra Bladder