

قال تعالى:

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

سورة البقرة الآية 32

DEDICATION

TO MY PARENTS

TO MY BROTHERS

TO MY TEACHERS

TO MY COLLEAGUES

TO MY FRIENDS

Acknowledgment

Through his holy direction and his holy will i have accomplished this work.

We are grateful for the help receive from our supervisor Dr.Ikhlaz Abd-alaziz and Mr. Suhaib Mohamed salih to whom always remain indebted. I want to thanks my friends who gives us his precious time and for his help and support during this research.

Abstract

Computed tomography (CT), is an x-ray procedure that generates high quality cross sectional images of the body, and by comparison to other radiological diagnosis, CT is responsible for higher radiation dose to patients.

The radiation dose was measured in three hospitals in Khartoum state during (April to September 2015) using different CT modalities.

In this study, the mean of dose for 64 slice was (924.5 ± 81.12 mGy.cm). The mean of dose for 16 slice (689.1 ± 92.5 mGy.cm). The mean of dose in 4 slice was (401.96 ± 108.3 mGy.cm). The dose is median than that reported in previous studies.

The radiation dose higher in Al-zytoun hospital than Al-Fisal and Khartoum hospitals. MSCT scanners 64 slice exposed patients to a higher dose than MSCT scanners 16 slice, and MSCT scanners 16 slice exposed patients to a higher dose than MSCT scanners 4 slice.

The radiologists and CT technologists must be trained to adapt CT scanning techniques based on clinical indications and to assess associated radiation doses with different scanning parameters.

The results presented will serve as a baseline data needed for deriving reference doses for KUB examinations in Sudan.

ملخص البحث:

التصوير المقطعي (CT) هو عملية انتاج صور عالية الجودة في شكل مقاطع لجسم المريض بالأستخدام الأشعة السينية، بالمقارنة مع اجهزة التصوير بالأشعة الأخرى، الأشعة المقطعية ذات جرعات اكبر للمرضى.

تم قياس الجرعة الإشعاعية للمرضى في ثلاث مستشفيات في ولاية الخرطوم خلال الفترة (ابريل - سبتمبر 2015) بأستخدام اجهزة متعددة الشرائح للتصوير بالأشعة المقطعية . كان متوسط الجرعة لجهاز الأشعة المقطعية متعدد الشرائح ذو 64 شريحة ($924.5 \pm 81.12 \text{ mGy.cm}$), متوسط الجرعة لجهاز الأشعة المقطعية متعدد الشرائح ذو 16 شريحة ($689.1 \pm 92.5 \text{ mGy.cm}$), متوسط الجرعة لجهاز الأشعة المقطعية متعدد الشرائح ذو 4 شرائح ($401.96 \pm 108.3 \text{ mGy.cm}$) والجرعات لهذه الدراسة متوسطة مقارنة بالدراسات السابقة وجدنا ان الجرعة الإشعاعية عالية في مستشفى الزيتونة مقارنة بالجرعة الإشعاعية لمستشفى الفيصل و مستشفى الخرطوم.

في هذه الدراسة جهاز الأشعة المقطعية ذو 64 شريحة يعطي جرعة أعلى للمريض من جهاز الأشعة المقطعية متعدد الشرائح ذو 16 شريحة و جهاز الأشعة المقطعية ذو 4 شرائح.

في هذه الدراسة، يجب ان يتم تدريب التقنيين واطباء الاشعة علي تقنيات الاشعة المقطعية بناء علي نوع الاختبار و وزن وطول المريض ليتم تقييم الجرعة الاشعاعية عن طريق عوامل المرتبطة بالجرعة الاشعاعية . نتائج الجرعة للمرضى سيتم الاستفادة منها في وضع مستويات الجرعة الاشعاعية التوجيهية في السودان.

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LIST OF ABBREVIATION

CT: Computed Tomography

CTU: Computed Tomography Urography

CTDIvol: Computed Tomography Dose Index volume

CTDIw: Computed Tomography Dose Index weighted

DAP: Dose Area Product

DLP: Dose Length product

ECG: Electrocardiography

EPO: Erythropoietin

KUB: Kidney Ureter Bladder

Kvp: Kilovolt penetration

MSCT: Multi Slice Computed Tomography

MDCT: Multi Detector Computed Tomography

mAs: milli Ampere second

RAS: Renin-Angiotensin System

SSCT: Single Slice Computed Tomography

Trot: Rotation Time