

Dedication

To my parents,
To anyone who taught
me a letter,
To my friends,
And to all my family.

Acknowledgements

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ABSTRACT

Computed Tomography (CT) is a diagnostic imaging modality giving higher patient dose in comparison with other radiological procedures, so the calculation of patient dose in CT exams is very important. CT improved the diagnosis many of the diseases. The increasing use of CT in the Sudan in recent years is what has to think in the attempt to reduce the exposure of the patient and that the risks known to the X-ray. This study aimed to measure the radiation dose and estimating the risks resulting from exposure to X-rays during the imaging by CT scan.

A total of 130 patients were examined in two hospitals using two spiral CT scans 64 slices (Alamal National and Alzaytouna specialist hospitals in the period (March 2011-June 2011)). The average age of the samples was 45 ± 18 years. The mean effective dose for Al-amal National hospital was 17.4 ± 12.7 mSv, 22.9 ± 14.3 mSv and 2.4 ± 0.9 mSv for the chest, abdomen and brain examinations, respectively. The mean effective doses for Al-Zaytouna specialist hospital were 26.3 ± 7.8 mSv, 47.6 ± 33.0 mSv, and 3.7 ± 1.5 mSv for the chest, abdomen and brain, respectively. The dose of this study is relatively higher compared to previous studies locally and internationally. This can be attributed to lack of training in CT dose optimisation and CT modality. The study showed the urgent need to review and evaluation of dose and also the need for continuous training of workers in this field and establishing the diagnostic reference level in the Sudan.

الملخص

الأشعة المقطعية هي تقنية تصوير طبي ، عند إستخدامها تعطي جرعة إشعاع عالية للمريض بالمقارنة مع الفحوصات الإشعاعية الأخرى، لذلك حساب الجرعات الإشعاعية للمرضى مهم جدا. كما أن الأشعة المقطعية زادت من المقدرة على تشخيص كثير من الأمراض. زيادة إستخدام الأشعة المقطعية في السودان في السنوات الأخيرة حفز الباحثين لخفض الجرعة الإشعاعية والخطر الإشعاعي المصاحب.

هدفت هذه الدراسة إلى قياس الإشعاع وتقدير الخطر الإشعاعي الناجم عن فحوصات الأشعة المقطعية للأجهزة ذات الأربعة وستون شريحة.

تم فحص 130 مريضا بكل من مستشفى الأمل الوطني و مستشفى الزيتونة التخصصي في الفترة من مارس وحتى يونيو 2011.

بلغ متوسط العمر للمرضى (45 ± 18) سنة. وبلغ متوسط الجرعة الفعالة (ملي سيفرت) في مستشفى الأمل الوطني $(2.4 \pm 0.9, 22.9 \pm 14.3, 17.4 \pm 12.7)$ لكل من فحوصات الصدر والبطن والرأس على الترتيب، كما بلغ متوسط الجرعة الفعالة (ملي سيفرت) في مستشفى الزيتونة التخصصي $(26.3 \pm 7.8, 3.7 \pm 1.5, 47.6 \pm 33.0)$ لكل من فحوصات الصدر والبطن والرأس على الترتيب.

أظهرت هذه الدراسة أن المرضى يتعرضون لجرعة من الإشعاع أعلى من الدراسات السابقة محليا وعالميا. يعزى ذلك إلى قلة التدريب في مجال أمثلة الجرعة الإشعاعية للمرضى وكذلك لنوع الأجهزة. كما بينت الدراسة الحاجة الماسة لتدريب العاملين ووضع مستوى مرجعي للجرعة الإشعاعية بالسودان.