Dedication

To the most precious gift that a human ever has, my parents.

My small family husband and lovely (Tasneem & Maab).

My brothers and sisters.

My friends and colleagues.

My teachers.

To all those dedicate my simple research daughters.

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Abbreviations

QC	Quality control
QA	Quality assurance
rpm	Revolution per minute
ev	Electron vault
Kev	kilo electron vault
KVp	Peak kilovoltage
mA	Milli-amperage
mAs	Milliampere seconds
ALARA	As Low As Reasonably Achievable
NCRP	National council on radiation protection
FDA	Food and drug administration
EAC	Automatic exposure control
HVL	Half value layer
PACS	Picture archiving and communication system
QM	Quality management
NRL	National radiation laboratory
A.E.R.B	Atomic Energy Regulatory Board

Abstract

Conventional radiography or X-ray is part of diagnostic imaging tool for detection and diagnosis of diseases. Since the X-ray was discovered in 1895 to 2010 more than 5 billion medical imaging studies were published worldwide. However, there are certain harmful biological effects were recorded; for that the concept of quality control and radiation protection was developed to minimize these effects.

But now in most of developing countries there is lack of awareness and interest of radiation protection and quality control in radiology department even sometimes there is no QC tools, which can lead to improper dose, risk to the machine, error in reading and image quality.

The present study had been carried out to evaluate the radiation protection and quality control measures in 15 radiology department in Khartoum state. Data had been collected divided in to two main parts, first part radiation protection tests, which include visual inspection test, room dimension, and scattered radiation. Secondly quality control tests which include output accuracy, linearity, reproducibility, collimator, filtration, beam alignment. The data were processed, analyzed and compared with standard tolerance of radiation protection and quality control test to determine whether these units comply with standards or not, and suggest any modification should be necessary to correct the observed defects.

The result of this study showed that, the average of acceptable percentage in all the units was 70% and 74% in radiation protection test and quality control test respectively. This percentage generally acceptable for all units.

المستخلص

جهازالتصوير الاشعاعي الثابت أو التقليدي بالأشعة السينية هو نوع من أدوات التصوير التشخيصي يستعمل لكشف و تشخيص الأمراض. منذ اكتشاف الأشعة السينية مي العام 1895 الى عام 2010 أكثر من 5 بليون دراسة أصدرت عن التصوير الطبي. لكن تم تسجيل بعض الاثار الحيوية الضارة الناتجة من التصوير الاشعاعي, لذلك تم عمل وتطوير مبادئ ضبط الجودة والوقاية من الاشعاع للتقليل من تلك الاثار.

لكن الان في معظم الدول النامية يوجد نقص في الوعي و الاهتمام بالوقاية من الاشعاع و ضبط الجودة في أقسام الاشعة حتى أحيانا لا توجد أدوات ضبط الجودة في القسم مما يؤدي الى اعطاء جرعات غير صحيحة, وخطر على جهاز الاشعة و أخطاء في جودة الصورة .

هذه الدراسة تعمل على تقييم اختبارات ضبط الجودة و الوقاية من الاشعاع في 15 قسم للاشعة في ولاية الخرطوم. البيانات المجموعة من وحدات الاشعة الثابتة في هذه الاقسام تنقسم الى نوعين من الاختبارات الاول اختبارات الوقاية من الاشعاع و تشمل اختبارات التفتيش البصري, ابعاد الغرفة وتشتت الاشعاع. الثاني اختبارات ضبط الجودة و تشمل اختبارات دقة الخرج, الخطية, اعادة انتاج الجرعة, المحدد, ترشيح الاشعة, محاذاة الشعاع. تم تحليل البيانات و مقارنتها بالمعيير القياسية لهذه الاختبارات و تحديد هل نتائج الوحدات مقبولة او لا و اقتراح التعديلات الضرورية لتصحيح الاخطاء الملاحظة في الدراسة.

أوضحت نتائج الدراسة ان متوسط الوحدات التي كانت نسبة الخطأ لديها مقبولة بلغت 70% و 74% لاختبارات الوقاية من الاشعاع وضبط الجودة على التوالي. وهذه النسبة مقبولة لكل الوحدات.

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