الآيـة

قال الله تعالى:

(اللّهُ لاَ إِلَهَ إِلاَّ هُوَ الْحَيُّ الْقَيُّومُ لاَ تَأْخُذُهُ سِنَةٌ وَلاَ نَوْمٌ لَّهُ مَا فِي السَّمَاوَاتِ وَمَا فِي الأَرْضِ مَن ذَا الَّذِي يَشْفَعُ عِنْدَهُ إِلاَّ بِإِذْنِهِ يَعْلَمُ مَا بَيْنَ أَيْدِيهِمْ وَمَا خَلْفَهُمْ وَلاَ يُحِيطُونَ بِشَيْءٍ مِّنْ عِلْمِهِ إِلاَّ بِمَا شَاء وَسِعَ كُرْسِيُّهُ السَّمَاوَاتِ وَالأَرْضَ وَلاَ يَؤُودُهُ حِفْظُهُمَا وَهُوَ الْعَلِيُّ الْعَظِيمُ)

صدق الله العظيم

سورة البقره الآيه 255

Dedication:

TO.....

OUR MOTHERS....& FATHERS

TO.....

OUR SISTERS .....& BROTHERS

TO.....

OUR TEACHERS

Acknowledgment:

Praise be and thanks first and foremost to Allah alone, and we praise and thank Him for His outward and inward the grace and a thousand prayers and peace upon Syed all human beings the prophet Mohammed peace be upon him.

A lot of thanks to anyone who helped us to finish this work.

And Special thanks to **DR. MOHAMMED ELFADHIL.**

Abstract

This research discusses the parameters that affected the optimization of exposure factors of lumbosacral region. This research found that most important parameter is weight and it is a significant one and can affected in to selection of exposure factors of lumbosacral region regardless if the patients male or female and the selection of exposure factors of AP and Lateral lumbosacral region don't influence by patients age and length. This research found a number of equations that can be give the patients the appropriate dose for imaging of lumbosacral region instead of guessing according to consideration of the patient or using of the exposure chart.

This equations proportion only with the weight, according to it can select the optimize exposure factors for lumbosacral region. The study consisted of 40 patients, their mean age, height; weight was **39.2±13.8, 166±7.9, 67.2±14.3** respectively. While the average exposure factors for AP concerning the **KV** and **mAs** was 80.5**±10.3, 36.9±10.3** respectively. and the average exposure factor for lateral projection concern **KV** and **mAs** was **87.4±5.1 , 44.1±7.**

الملخص

يناقش هذا البحث أمثلة عوامل التصوير للمنطقه القطنية العجويه .وجدت هذه الدواسه ان أكثر العوامل أهميه هو للوزن ،ويمكن ان تنفذ بإختيار عوامل تعويض المنطقه القطنية العجويه بغض النظر اذا كان المريض زكراً او أنثي ،و إختيار عوامل التعويض الأمامي الخلفيو الجانبي للمنطقه القطنية العجويه لا يتأثر من قبل طول عمر المريض . ووجد هذا البحث عدد من المعادلات التي يمكن ان تكون عن طريقها اعطاء الوضي جوعه مناسبة لتصوير المنطقه القطنية العجوية بدلاً من التخمينو فقاً للنظر للمريض او عن استخدام جدولة عوامل التعويض . هذه المعادلات تتناسب فقط مع للوزنو فقاً لذلك يمكن تحديد عوامل التعوض الأمثل للمنطقة القطنية العجوية.

هذه الدواسه مكونه من لربعين ويضاًو تعتمد هذه الدواسه علي العمرو الطول للوزن .ووسطها الحسابي بالترتيب:

39.2±13.8,166±7.9,67.2± 14.3

بينما متوسط عوامل التعويض (كيلوفولتو مل امبير) في الفحص الامامي الخلفي للمنطقه القطنية العجويه كانت بالترتيب:

80.5±10.3,36.9± 10.3

بينما متوسط عوامل التعويض (كيلوفولتو ملي امبير) في الفحص الجانبي للمنطقه القطنية العجويه كانت بالترتيب:

87.4±5.1,44.1± 7

Abbreviation:

Abbreviation	Meaning
L/S	Lumbosacral
SSD	Source surface distance
Kvp	Kilovoltage peak
mA	Milliamper
AEC	Automatic exposure control
CT	Computer tomography
MRI	Magnetic resonance imaging
FGP	Fluoroscopy guiding positioning
Fig	Figure
Lat	Lateral
AP	Antroposter

Table of contents

Subject	Page No.
الأية	
Dedication	I
Acknowledgement	II
Abstract {English}	III
Abstract {Arabic}	IV
Abbreviation	V
Table of content	VI
List of Figures	IX
List of Table	X

Chapter One: Introduction:

Subject	Page No.
Image quality	2
Image contrast	2
Blur and visibility of detail	3
Noise	4
Artifact	4
Distortion	4
Patient protection in diagnostic radiology	5
Technique exposure factor	5
Screen /film combination	6
Exposure control	6
Collimation	7
Computed tomography	8
Magnetic resonance imaging	9
Problem of the study	10
Objective	10
Justification of the study	11
Over view of the study	11

Chapter 2: Previous studies:

subject	Page No.
Anatomy review of the spine	12
Anatomy of lumbosacral junction	13
Curves	14
Regions	14
Function of the back	15
x-ray production	15
Previous study	16

Chapter 3: Materials and Methods:

subject	Page No.
Materials	18-23
Methodology	23-24

Chapter 4: The Result:

Subject	Page No.
Results	25-28

Chapter 5: Discussion, Conclusion and Recommendations:

Subject	Page No.
Discussion	29-31
Conclusion	32
Recommendations	33
References	34-36
Appendices	37-41

List of figures:

Subject	Page No.
Fig.1-1 Effect of Blur on Visibility of Image Detail	3
Figure 2-1 shows lumbosacral anatomy	13
Fig: 2-2 shows curvature of spine	14
Fig: 2-3 shows five regions of the spinal column.	15
Fig 3-2-1- Shows Lateral projection of lumbosacral	21
Fig: 3-2-2 Shows Ap projection of lumbosacral.	23
Figure 4-1 scatter plot show the correlation between Weight (Kg) and Kvp in Ap lumbosacral x-ray	26
Figure4-2 Scatter plot show correlation between Weight (Kg) and Kvp in lateral lumbosacral x-ray	27
Figure 4-3 Scatter plot show the correlation between Weight (Kg) and mAs in Ap lumbosacral x-ray	27
Figure 4-4 scatter plot shows the correlation between Weight (Kg) and mAs in lateral lumbosacral x-ray	28

List of Tables:

Subject	Page No.
Table 4-1 an independent t-test of the exposure factor in respect to gender (male and female)	25
Table 4-2 a demographic results of parameter data (mean ± stander deviation)	26