

Acknowledgements

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Dedication

To face of good helps me, all thought this work, and ever after, whom I ask more assistance and support

To my beloved and blessed parents who did every things for me .to my sisters, brothers, friends and everyone who wished good for me.

List of contents

Acknowledgement.....	i
Dedication.....	ii
List of contents.....	iii
List of table.....	vi
List of figure.....	viii
List of abbreviation.....	ix
Abstract.....	x
Abstract in Arabic.....	xi

CHAPTER ONE

Introduction.....	2
1-1 Problem of the study.....	4
1-2 Objectives.....	4
1-3 Significance of the study.....	5
1-4 Overview of the study.....	5

CHAPTER TWO

2-1 Theoretical background.....	7
2-1-1 Bones of the Skull.....	7
2-1-2 Physiology of the skull.....	12
2-1-3 Pathology of the skull.....	12
2-1-3-1 Fracture.....	12
2-1-3-2 Infection disease.....	13
2-1-3-3 Tumors.....	16
2-1-4 Skull radiography.....	20
2-1-4-1 Major Landmarks used for skull radiography.....	20
2-1-4-2 Major body planes used in Skull radiography.....	20
2-1-4-3 Major Baselines used in Skull Radiography.....	22
2-1-4-4 Radiographic technique	23
2-1-4-5 Exposure factors.....	23
2-2 Previous studies.....	27

CHAPTER THREE

Methodology.....	31
3-1 Material.....	31
3-2 area of study.....	38
3-3 Method of data collection.....	38
3-4 Technique.....	39
3-5 Data analysis.....	40
3-6 Ethical consideration.....	41

CHAPTER FOUR

Results.....	43
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CHAPTER FIVE

Discussion conclusion and recommendation	
5-1 Discussion.....	50
5-2 conclusion.....	51
5-3 recommendation.....	52
References.....	53
Appendix A.....	54
Appendix B.....	55

LIST OF TABLE

Table 3-1 the data collection table from the patient using 8 variables for each patient.....	39
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LIST OF FIGURES

Figure 2-1 Lateral view of the skull.....	9
Figure 2-2: Anterior view of the skull.....	10
Figure 2-3: Posterior view of the skull.....	11
Figure 2-4: Bones of base of the skull.....	11
Figure 2-5: 1.Vertex 2.External Occipital Protuberance (E.O.P.) 3. External Auditory Meatus 4. Outer Canthus Of Eye. 5. Infra-orbital point 6. Nasion7. Glabella.....	20
Figure 2-6: MSP Auricular Anthropological.....	21
Figure 2-7: Anthropological Orbital MeatalInterpupillary.....	23
Figure 2-8: Lateral skull radiography.....	25
Figure 2-9: Lateral skull radiography.....	26
Figure 3-1: x-ray tube and table.....	35
Figure 3-2: Control panel.....	35
Figure 3-3: CR processing system (cassette holder and computer)	36
Figure 3-4: Processing unit (CR) image plate reader.....	37
Figure 3-5: Lesser printer.....	37

Figure 3-6 patient position and central ray.....40

Figure 4-1 a histogram plot shows the frequency distribution of the applied Kv, with the mean value 61.1 ± 2.3 and the normal distribution curve over-plotted....43

Figure 4-2 a histogram plot shows the frequency distribution of (A) the applied mAs, with the mean value 16.9 ± 2.1 and (B) the BPD 16.9 ± 1.4 , with the normal distribution curve over-plotted.....44

Figure 4-3 a histogram plot shows the frequency distribution of (A) patient age with the mean value 31.7 ± 11.3 years, and (B) the patient weight (67.9 ± 15 Kg), with the normal distribution curve over-plotted.....45

Figure 4-4 a histogram plot shows the frequency distribution of (A) patient height with the mean value 167.3 ± 8.4 cm, and (B) the patient BMI (24.1 ± 5.1 Kg/m²), with the normal distribution curve over-plotted.....46

Figure 4-5 scatter plot of the exposure parameter (Kv) versus the BPD, with a tend line shows a direct linear proportionality.....47

Figure 4-6 scatter plot of the exposure parameter (mAs) for male versus the BPD, with a tend line shows a direct linear proportionality.....47

Figure 4-7 scatter plot of the exposure parameter (mAs) for female versus the weight, with a tend line shows a direct linear proportionality48

List of abbreviations

EP	Exposure points
MSP	Median Sagittal Plain
IOML	Infra OrbitoMeatal Line
EAM	External Auditory Meatal
KV	Kilo Voltage
mAs	MilliAmpair Second
FFD	Focal Film Distance
C1	Cervical Spine One
BPD	Bi-parietal Dimensions
BMI	Body Mass Index
EOP	External Occipital Protuberance
S	Second
CC	Conventional cephalogram
MC	Modified collimation
CR	Computerized radiography
IR	Image receptor

Abstract

The main objective of this study was to develop a linear system that can be used to generate an optimized exposure factors which can be used to acquire lateral skull x-ray objectively. The data of the study consisted of 50 patients' examined by lateral x-ray skull in Baraha Medical City hospital in Khartoum\Sudan in the period from September 2012 to December 2012 using Axiom Iconos R200 Siemens machine. The data were collected using eight variables; they include: exposure factor (Kv and mAs), patient age, weight, height, bi-parietal dimension (BPD), body mass index and gender. The result of the study showed that, the mAs showed a significant difference between male and female at $p = 0.05$ with $t = 2.2$ and $p = 0.03$, while there is no significant difference concerning the Kv. The result also showed that there is linear association between the Kv and BPD where the Kv increased by 1.02 unit per cm of BPD. In case of male the mAs associated with the BPD where it increased by by 1.01 unit per cm of BPD. Similarly the female were associated with patient weight, where mAs increased by 0.07 unit per Kg of weight.

ملخص البحث

تمثل الهدف الرئيسي لهذه الدراسة في تطوير نظام تصوير اشعه الرأس الجانبيه وذلك بإستخدام عوامل التعريض المثلى، وتضمنت هذه الدراسة عدد ٥٠ مريضاً أخذت لهم صورته جانبيه للرأس، أجريت الدراسة في الفتره من سبتمبر ٢٠١٢ وحتى ديسمبر ٢٠١٢ بمستشفى مدينة البراحه الطبيه الخرطوم\السودان بإستخدام جهاز سيمنس الالمانى. تم جمع البيانات من المرضى متضمنه ٨ متغيرات هيعوامل التعريض (kv+mAs)، وزن المريض، العمر، الطول، ابعاد الرأس الجانبيه، الجنس، وكتلة الجسم أظهرت الدراسة ان هنالك إختلاف في كمية الاشعه (mAs) بين الرجال والنساء (p ٠.٠٥ مع t ٢.٢ و p ٠.٠٣) في حين لم يكن هنالك إختلاف كبير يتعلق بقوة الإختراق (kv) النتائج اظهرت ايضا ان هنالك رابطه بين قوة الاختراق (kv) والابعاد الجانبيه للرأس (BPD) حيث ترتفع بنسبة ١.٠٢ كيلو فولت لكل وحدة طول من (BPD). في حالة الرجال كمية الاشعه (mAs) ترتفع بنسبة ١.٠١ لكل وحدة طول من (BPD)، وبالمثل ايضا في حالة النساء كميته الاشعه مع وزن المريض حيث زادت الكميته (mAs) بنسبة ٠.٠٧ وحده لكل كيلو جرام من الوزن.