

بسم الله الرحمن الرحيم

قال الله تعالى

((وَقُلْ رَبِّ اَدْخِلْنِيْ مُدْخَلَ صِدْقٍ وَّاَخْرِجْنِيْ مُخْرَجَ صِدْقٍ

وَاجْعَلْ لِّيْ مِنْ لَّدُنْكَ سُلْطٰنًا نَّصِيْرًا))

(صدق الله العظيم)

سورة الإسراء الايه (٨)

Dedication

I dedicate this simple work to my husband
who always support and encourage me to
continue.

To my mother who's always wants me to
be the best.

To the soul of my father and my
grandmother

Acknowledgement

I appreciate the help of my supervisor
DR DUHA ABDUO MOHAMED, who
follow, review and organize this
work without boring in spite of her
great responsibilities

Abstract

This study for Evaluation of Magnetic Resonance Imaging and clinical finding in Diagnosing Epilepsy It was carried out in magnetic resonance imaging department in alzaytouna specialist hospital in Khartoum, where 100 samples were collected randomly from male, female patients of different age's groupsto determine the most age group affected by seizures diagnosing by MRI ,to determine the underlying cause of epilepsy, To correlate the different pathology caused epilepsy with the clinical findings.

100 participants had undergone brain magnetic resonance imaging (MRI) in Toshiba machine 1.5 tesla by using ahead coil (phased array coil).

Clinical information of seizures findings were conducted verbally from participants by using questionnaires before (MRI) exam.

The magnetic resonance finding of every participant was correlated with clinical finding which were gathered through questionnaire.

The researcher used power point excels for analysis of the data.

The researcher found that seizures caused by multiple disease and different clinical signs in differ age group diagnosed by magnetic resonance imaging for example; The age group ≥ 15 was the maximum group affected by atrophy and meningio-encephalitis with different severity by clinical signs of convulsion,fever,super,hypoxia,non walking, vertigo and headache .

The age group ≤ 31 was the maximum age group affected by stroke with clinical signs of convulsion.

ملخص البحث

هدفت هذه الدراسة لتقويم التصوير بالرنين المغناطيسي والنتائج السريرية في تشخيص الصرع، التي أجريت بقسم الرنين المغناطيسي في مستشفى الزيتونة التخصص ولاية الخرطوم.

تم جمع ١٠٠ مريض عشوائيا من الرجال والنساء في مختلف الفئات العمرية، لإيجاد الفئة العمرية الأكثر تأثرا بالتشنجات التي تم تشخيصها بفحص الرنين المغناطيسي، الاسباب المؤدية للتشنجات، لإيجاد علاقه بين العلامات السريرية والامراض المختلف المسببه للتشنجات .

اخضع ١٠٠ مريض لفحص المخ بالرنين المغناطيسي في جهاز توشيبا 1.5 تسلا باستخدام لفائف الرأس .

تم جمع المعلومات السريرية من المريض شفاهه وتم ملا البيانات بواسطة هذه المعلومات قبل فحص المخ بالرنين المغناطيسي.

تمت مقارنه نتائج فحص المخ بالرنين المغناطيسي مع العلامات السريرية المتحصل عليها من الاستبيان لكل مريض .

تم استخدام برنامج اكسل في تحليل البيانات .

خلصت الدراسه ان التشنجات الناتجة من مختلف الامراض بمختلف العلامات السريرية في مختلف الفئات العمرية التي تم تشخيصها بالرنين المغناطيسي مثال: الفئة العمرية اقل من ١٥ سنه هي الفئة الأكثر تأثرا بضمور المخ والتهاب السحائي والدماغ باختلاف فتره التعرض للتشنج وحدته بعلامات سريرية كالحمي،الذهول ،نقص الأكسجين،عدم القدرة علي المشي ،الدوخة والصداع.

الفئات العمرية اكبر من ال ٣١ سنه هي الفئات الأكثر تأثرا بالسكتة الدماغية بعلامات سريرية كالتشنج .

Table of contents

No	Content s	Page no
	Quran karim	I
	Dedication	II
	Acknowledgment	III
	Abstract	IV
	Table of contents	VI
	List of figures	VIII
	List of tables	IX
	List of abbreviations	X
	Chapter one	
١-١	Introduction	١
1-2	Problems of the Study	2
1-3	Objectives Of The Study	2
1-4	Overview of the study	٣
	Chapter two	
2-1	Theoretical background	٤
2-1-1	Anatomy of the brain	٤
2-1-2	Physiology of the central nervous system	١٢
2-1-3	pathology	١٨
2-1-4	MRI physics	٢٣
2-1-5	Brain MRI technique	٣٠
٢-٢	Previous studies	٣٢
	Chapter three Material and method	
3-1	Material	36
3-1-1	Study area	36
3-1-2	Machine	36
3-2	Method	36
3-2-1	Patient preparation	٣٧
3-2-2	Patient positioning	38
3-2-3	technique used	38

3-2-4	data collection	39
3-2-5	data analysis	39
3-2-6	Study area	39

	Chapter four Results	
4-1	Results	40
	Chapter five (discussion, conclusion and recommendation for further studies)	
5-1	Discussion	55
5-2	Conclusion	61
5-3	recommendation for further studies	62
	Reference	63
	Appendices	I

	List of figure	
2-1	Coronal section of the upper part of the head	٥
2-2	Interior of the skull	٦
2-3	Diaphragmasellae and tentorium cerebelli.	٦
2-4	Lateral view of the skull	٧
2-5	Right side of the brain	١٠
2-6	Circle of willies.	١٣
2-7	Head coil	٢٤
2-8	MRI magnet	٢٥
2-9	T1 curve	٢٥
2-10	T2 curve	٢٥
2-11	Brain MRI -axial flair without contrast	V
2-12	Brain MRI-axial flair without contrast	V
2-13	Patient with encephalities flair brain MRI image show increased FLAIR signal intensity within the subarachnoid space.	IV
2-14	Fig (2.14) MRI study of Brain shows: Bilateral patchy ill defined parietal T2 hyper intensities	IV

	list of tables	
4-1	shows the frequency and percentage of MRI findings for seizure patients	40
4-2	shows frequencies and percentage of pathology and normal cases caused seizures	41
4-3	shows the distribution of atrophy according to age group	42
4-4	shows the distribution of meningio-encephalities according to age group	43
4-5	shows the distribution of stroke according to age group	44
4-6	shows the distribution of tumor cases according to age group	45
4-7	shows the distribution of congenital abnormalities cases according to age group	46
4-8	shows the distribution of normal cases according to age group	47
4-9	shows the distribution of pathology and normal cases according to age group	48
4-10	shows the distribution of clinical finding among atrophy cases	49
4-11	shows the distribution of clinical finding among tumor	50
4-12	shows the distribution of clinical finding among meningio-encephalities cases	51
4-13	shows the distribution of clinical finding among stroke cases	52
4-14	show the effect of clinical finding on the final diagnosing	53
4-15	show the effect of clinical finding on the final diagnosing	47

	:	
4-9	shows the distribution of pathology and normal cases according to age group	48
4-10	shows the distribution of clinical finding among atrophy cases	49
4-11	shows the distribution of clinical finding among tumor	50
4-12	shows the distribution of clinical finding among meningio-encephalities cases	51
4-13	shows the distribution of clinical finding among stroke cases	52
4-14	show the effect of clinical finding on the final diagnosing	53
4-15	show the effect of clinical finding on the final diagnosis	54

List of abbreviations

MRI	magnetic resonance imaging
EEG	Electroencephalography
SSS	superior sagittal sinuses
CA	carotid artery
CN	cranial nerve
CA	cerebral artery
LV	lateral ventricle
CNS	central nervous system
PNS:	peripheral nervous system
K ⁺ :	potassium ions
SPS	simple partial seizure
PCG	posterior central gyrus
SSS	somatosensory seizure
SS	simple seizure
RF	Radiofrequency
PS	pulse sequence
SE	spin echo
CSE	conventional spin echo
FA	flip angle
PD	proton density
SNR	signal to noise ratio
CNR	contrast to noise ratio
TSE	turbo spin echo
ETL	echo train length
IR	inversion recovery

STIR	short T_1 inversion recovery
FLAIR	fluid attenuated inversion recovery
CSF	cerebro spinal fluid
GRE	coherent gradient echo
EPI	echo planer imaging
VOI	volume of interest
FMRI	functional magnetic resonance imaging
CHESS	chemical shift selective pulse
MT	magnetization transfer
IED	Inter ictal epliptic discharge
BOLD	blood oxegenation level dependent
GLM	general linear model
ICA	independent component analysis