

## **Abstract**

Epilepsy is a central nervous system (neurological) disorder in which brain activity becomes abnormal, causing seizures or periods of unusual behavior, sensations, and sometimes loss of awareness. The study aimed to evaluate the correlation of both EEG and MRI FLAIR in diagnostic of epilepsy in the Khartoum City.

Magnetic resonance imaging (MRI) and electroencephalography (EEG) techniques were evaluated for each patient. A total of 55 patients in Alzaitoona Special Hospital and Modern Medical Center during the period spanned from July 2018 until December 2018 are studied.

The study shown that, the most frequent type of epilepsy in EEG finding was generalized that had the percentage of about(76.4%). The study also characterized the brain in a patient with epilepsy, it was found that the number of patients diagnosed as lesion and brain atrophy was (21 and 10) respectively, and found that there was a significant chi square relation between them in MRI at  $p<0.01$ .

Temporal lobe was the most common location of lesion in MRI (34.5%). Cystic lesion followed by Ischaemia (23.8% and 14.3% respectively) were the most common lesions type, a significant relationship was observe between lesions location and type in MRI at  $p<0.01$ .

Study also found that all patients diagnosed with ventricular system dilatation, had lesions and increasing in brain volume at significant chi square at  $p<0.01$  for both variables.

The study concluded that, both MRI flair and EEG should be used in diagnosis of epilepsy they had complementarity role; MRI detected the cause of epilepsy while EEG discovered the first onset of the disease.

The study recommend to use specialized protocols instead of using routine scanning protocol include Magnetic Resonance Spectroscopy (MRS), functional MRI (fMRI) and FDG-PET scan for further diagnosis or when MRI is normal or showed nonspecific findings.

## المستخلص:

الصرع هو اضطراب الجهاز العصبي المركزي (العصبي) الذي يصبح فيه نشاط الدماغ غير طبيعي مما يسبب نوبات أو فترات من السلوك غير العادي والأحاسيس وفقدان الوعي في بعض الأحيان

تهدف الدراسة إلى تقييم العلاقة بين كل من الرنين المغناطيسي و تخطيط أمواج الدماغ في تشخيص الصرع في ولاية الخرطوم

تم تقييم تقنيات التصوير بالرنين المغناطيسي وتخطيط أمواج الدماغ لكل مريض تمت دراسة 55 مريض مصاب بالصرع في مستشفى الزيتونة التخصصي و المركز الطبي الحديث خلال الفترة الممتدة من شهر يوليو 2018 الى ديسمبر 2018.

أوضحت الدراسة ان معظم المرضى اللذين تم تشخيصهم بتخطيط المخ وجدته ان هنالك فرط في نشاط المخ في جميع اجزاءه بنسبه (76.4%)

وصفت الدراسة الدماغ في مريض الصرع وقد وجد ان عدد المرضى اللذين تم تشخيصهم بوجود أفة وضمور في المخ كان (10,21) على التوالي ووجدت ان هناك علاقة كبيرة بينهما في التصوير بالرنين المغناطيسي بمعدل ارتباط اقل من 0.01

الفص الصدغي الثنائي كان الموقع الأكثر شيوعاً للأفة في التصوير بالرنين المغناطيسي (38.5%) وكانت الكتلة الكيسية تليها فقر الدم الموضعي (14.3% 23.8%) على التوالي نوع الأفات الأكثر شيوعاً وموقع الأفات وجدت لهم علاقة كبيرة في التصوير بالرنين المغناطيسي بمعامل ارتباط اقل من 0.01

ووجدت الدراسة أيضاً أن جميع المرضى اللذين تم تشخيص توسعهم في نظام البطين كانوا يعانون من آفات وزيادة في حجم المخ عن ارتباط كبير اقل من 0.01 لكلا المتغيرين

ولخصت الدراسة إلى انه ينبغي استخدام كلاً من التصوير بالرنين المغناطيسي وتخطيط أمواج الدماغ في تشخيص الصرع لديهم دور التكامل حيث ان الرنين المغناطيسي كشف عن سبب الصرع وتخطيط أمواج الدماغ كشف عن أول ظهور للمرض

توصي الدراسة باستخدام البرتوكولات المتخصصة بدلاً من استخدام بروتوكول المسح الروتيني بما في ذلك الرنين المغناطيسي الطيفي والرنين المغناطيسي الوظيفي وفحص GDF-TEP لإجراء مزيد من التشخيص أو عندما يكون التصوير بالرنين المغناطيسي طبيعياً او يظهر نتائج غير محدد.

## **Dedication**

Every challenging work needs self-efforts as well as guidance of some body especially those who were very close to my heart Shoog abdo.

To my wonderful family and a lovely husband Loai. The reason for what I became today, thanks for your great support and continues care.

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## LIST OF ABBREVIATION

CNS	Central Nervous System
CSF	Cerebrospinal Fluid
CT	Computerized Tomography
DTI	Diffusion Tensor Imaging
DWI	Diffusion Weighted Imaging
EEG	Electroencephalogram
ET	Echo Time
FDG	Fluoro-Deoxy Glucose
FLAIR	Fluid Attenuation Inversion Recovery
fMRI	Functional Magnetic Resonance Imaging
FSE	Fast Spin Echo
GE	General Electric
GRE	Gradient Recalled Echo
GTCS	Generalized Tonic-Clonic Seizures
Hz	Hertz
ICU	Intensive Care Unit
ILAE	International League against Epilepsy
LTM	Long Term Monitoring
mm	Millimeter
ms	Millisecond
MRA	Magnetic Resonance Angiography
MRI	Magnetic Resonance Imaging
MRS	Magnetic Resonance Spectroscopy
MRV	Magnetic Resonance Venography
mV	Medium Voltage
NAA	N-Acetylaspartate
NMR	Nuclear Magnetic Resonance
PD	Proton Density
PET	Positron Emission Tomography
PNS	Peripheral Nervous System
RF	Radiofrequency
RT	Repetition Time
SE	Spin Echo
SPSS	Statistical Package for the Social Sciences
SWI	Susceptibility Weighted Imaging

T	Tesla
T1W	T1-weighted
T2W	T2-weighted
WHO	World Health Organization
3D	Three Dimension