

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

**Sudan University of Science and
Technology**

College of Graduate studies

**ACCURACY OF MAGNETIC RESONANCE
IMAGING (MRI) IN DIAGNOSIS OF ACUTE
CEREBRAL INFARCTION**

**دقة التصوير بالرنين المغنطيسي في
تشخيص جلطة الدماغ الحادة**

**A thesis submitted for partial fulfilment of
the requirement of M.Sc. degree in
.Diagnostic Radiological Technology**

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Dedication

**To my leaders, Mather,
wife, children and
brothers**

**For their inspiration and
...encouragement**

To the soul of my father

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Acknowledgement

Generally, I have to give my heart-felt thanks to all people who were responsible for the successful of this research.

In particular I would like extend my thanks and appreciation to Mr. Hussein Ahmed Hassan for his helpful supervision of this research.

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II Abstract

MRI is a new and promising tool that is being increasingly used in the diagnosis of acute cerebral infarction cases.

This study was carried out in Umdorman Military Hospital , using MRI, and CTscan as another comparative tool to detect acute stage of cerebral infarction and determine the accuracy of MRI in evaluation of acute cerebral infarction .

The study was based on thirty (30) adult patients with clinically diagnosed acute cerebral infarction, and were grouped according to sex; male (n=14) and female (n= 16) and according to age (20-40)years(n=5),(40-60)years(n=16)and(60-80) years(n=9).

The patients were imaged by both MRI and CT from 24 hours to 4 days after onset of symptoms, all images were interpreted to diagnose imaging findings.

The study result showed that the accuracy of MRI for acute cerebral infarction was (83%) and the accuracy of CT was 57%.

It was concluded that the MRI has a very high accuracy in diagnosis of acute cerebral infarction.

III ملخص البحث

إن التصوير بالرنين المغنطيسي يعتبر وسيلة حديثة و واعدة حيث أصبحت تستخدم باستمرار في تشخيص حالات الجلطة الدماغية الحادة.

أجريت هذه الدراسة بمستشفى أم درمان العسكري باستخدام التصوير بالرنين المغنطيسي و الأشعة المقطعية بالكمبيوتر تهدف هذه الدراسة إلي إكتشاف الجلطة الدماغية في المرحلة الحادة ومعرفة دقة التصوير بالرنين المغنطيسي في تقييم الجلطة الدماغية الحادة.

هذه الدراسة إتمدت علي 30 عينة من أفراد بالغين تم تشخيصهم سريريا بأنهم مصابون بالجلطة الدماغية الحادة حيث تم تقسيمهم إلي مجموعتين إستنادا الي الجنس: المجموعة الأولى ذكور و عددهم 14 مريض , المجموعة الثانية إناث و عددهن 16 مريضة. كما تم تقسيمهم الي ثلاثة مجموعات إستنادا الي العمر: المجموعة الأولى من 20 الي 40 سنة و عددهم 5, المجموعة الثانية من 40 إلي 60 و عددهم 16, و المجموعة الثالثة من 60 إلي 80 و عددهم 9 مريض.

تم تصوير المرضى بكل من الرنين المغنطيسي و الأشعة المقطعية بالكمبيوتر خلال 24 ساعة الي 4 أيام من ظهور أعراض المرض عليهم ثم تم تشخيص و تقييم الصور بعد ذلك حيث أظهرت الدراسة دقة التصوير بالرنين المغنطيسي قد بلغت 83% و الأشعة المقطعية بالكمبيوتر 57.

خلصت الدراسة الي أن التصوير بالرنين المغنطيسي دقيق جدا في تشخيص الجلطة الدماغية الحادة.

IV Abbreviations

MRI	Magnetic Resonance Imaging
NMR	Nuclear Magnetic Resonance
TV	Television
fMRI	Functional Magnetic Resonance Imaging
CT	Computed Tomography
MRA	Magnetic Resonance Angiography
CSF	Cerebrospinal Fluid
ACA	Anterior Cerebral artery
MCA	Middle Cerebral Artery
PCA	Posterior Cerebral Artery
PICA	Posterior Inferior Cerebral Artery
CNS	Central Nervous System
EBV	Epistim-Barr Virus
EEG	Electroencephalogram
AD	Alzheimer's disease
EPI	Echo-planner Imaging
GUI	Graphic user Interface
OEMs	Original Equipment Manufactures
3PPM	Three Parts per Million
CBV	Cerebral Blood Volume
CBF	Cerebral Blood Flow
DWI	Diffusion Weighted Image
CAT	Computed Axial Tomography
TE	Time of Echo
TR	Time of Repetion
FLAIR	Fluid Attenuation Inverse Recovery
RF	Radio Frequency
IV	Intra Venous
GE	General Electric Company
MHz	Mega Hertz

T	Tesla
CSE	Conventional Spin Echo
SNR	Signal to Noise Ratio
FOV	Field Of View
NEXT	Number or Excitation

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