

## **DEDICATION**

To those whom within my heart meaning of love and

Infinite care

My parents

To all those whom decorate my time days and years my Friends

## **ACKNOWLEDGMENT**

First and foremost, I would acknowledge this thesis to

,Dr. Mohamed El-Bashir

Also I would thank the engineers and technicians In the Khartoum and  
.Al-amal hospitals for their help

## **ABSTRACT**

The Nuclear Magnetic Resonance Imaging (NMR) system is one of the most important modalities which used in diagnostic of the neuro-diseases. It can detect the small variation within the same type of tissue. The MRI

also can detect the physiological changes as well as the anatomical changes.

The purpose of this study is to demonstrate small variation among the gray and the white matter within a normal human brain, to achieve this objective, the NMR parameters (the slice thickness, the repetition time and the echo time), were adjusted. the longitudinal relaxation time (T1) and the transverse time (T2) of the brain gray matter and white matter had been measured, using a normal volunteer at magnetic strength of 1.5 T. bird cage volume resonator was used and the values of T1 for the gray matter was found to be  $(1320.6 \pm 302.3)$  ms. and T1 for the white matter was  $(1367 \pm 317.2)$  ms. While the values of T2 of the gray and white matter were to be found  $(992.2 \pm 7.4)$  ms and  $(990.23 \pm 6.4)$  ms respectively.

The result proved that the knowledge of the normal T1 and T2 values and their variations would be essential for making such diagnoses.

## الخلاصة

جهاز الرنين المغناطيسي أحد أهم الاجهزة المستخدمة في تشخيص الامراض العصبية لم قدرته الفأقة علي كشف أقل تغيير داخل النسيج الواحد. كما له القدرة الفأقة علي كشف الفرق الفسيولوجية بنفس م قدرته علي تحديد التغيرات التشريحية.

هذه الدراسة تظهر الفرق بين المادة السنجابية والمادة البيضاء في المخ البشري الطبيعي. لتدقيق هذا الهدف ضبطت عوامل الجهاز ( سمك الشريحة، زمن التكرار و زمن الصدي) حسب قيم زمن الاسترخاء الطولي ( T1 ) و زمن الاسترخاء المستعرض ( T2 ) لكل من المادة السنجابية والمادة البيضاء باخذ صور لمخ بشري طبيعي بواسطة جهاز الرنين المغناطيسي ذو شدة مجال قدره 1.5 تسلا. وجد ان T1 للمادة السنجابية يساوي  $1320.6 \pm 302.3$  ms و للمادة البيضاء يساوي 1367 + 317.2 ms . وحسبت T2 للمادة السنجابية تساوي  $992.2 \pm 7.4$  ms و للمادة البيضاء تساوي  $990.23 \pm 6.4$  ms هذه القيم بينت فرقا واضحا بين النسيجين. نتائج البحث اثبتت أن المعرفة بالقيم الطبيعية لـ T1 and T2 والتغيير فيهما يمكن الاعتماد عليهما في التشخيص السليم.

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