الآية الكريمة

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال تعالي:(اقرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ (1) خَلَقَ الإِنسَانَ مِنْ عَلَقٍ (2) اقْرَأْ وَرَبُّكَ الأَكْرَمُ (3) الَّذِي عَلَّمَ بِالْقَلَمِ (4) عَلَّمَ الإِنسَانَ مَا لَمْ يَعْلَمْ(5))

صَدَقَ اللَّه الْعَظِيم

سورة العلق : الآيات (1- 5)

Dedication

This work is lovingly dedicated to The soul of my father,

To My mother, for her patience, encouragement
and continues support

To My husband and children for their patience, understanding and encouragement

To my brothers and sister for their help and support

To my friends for their valuable advice

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Abstract

Knowledge of the normal size range of the optic chiasm can be helpful in the early detection of some disorders, The height and width of the optic chiasm can be measured with the use of commercially available software, which allows an objective estimate of the chiasm's size, most magnetic resonance units now in use have the capabilities to furnish the region of interest measurements. The aim of this research was to identify the dimensions of optic chiasm in magnetic resonance imaging of the brain using coronal cuts. This retrospective and prospective study included 205 Sudanese patients, 89 patients (43.4 %) were females 116 patients (56.6%) were males with different ages ranges (between 16-78 years old) referred to Radiology Departments of Royal Care Hospital and Antalya Medical Center in Sudan, in the period between 2015 to 2018.

All the patients underwent MRI brain, diagnosis by experienced radiologists, 172 patients were diagnosed as a normal brain, and 33 patients having pathological changes, all measurements of optic chiasm were done on coronal cuts of brain magnetic resonance imaging using general protocol.

The mean width ± standard deviation (SD) of the optic chiasm for the normal patients was: 13.04 millimeter ± 1.21 and the mean ± SD of the height was: 2.46 millimeter ± 0.14. The mean width ± SD of the optic chiasm for the abnormal patients was: 13.32 millimeter ± 1.28 and the mean ± SD of the height was: 2.53-millimeter ± 0.184, for all samples normal and abnormal the mean width± SD of optic chiasm was 13.08 millimeter ± 1.22, mean width± SD

height was 2.47 millimeter ± 0.154, the range of the Sudanese optic chiasms width between 10.18 millimeter and 15.12 millimeter± 1.2 standard deviations and a height between 2.11 millimeter and 3.04 millimeter ±0.15 standard deviation can be considered definitely normal. Chiasms measurements outside these ranges should be considered abnormal and prompt further investigation. Correlation between age and gender yielded no significant differences.

The study concluded that the calculated measurement of the normal optic chiasm on brain magnetic resonance image can be used as a comparative standard by which to detect relatively smaller or larger chiasms, and added basic and important information to the dimensions of chiasm measurement in the Sudanese population and will positively affect the early diagnosis of some diseases in the future.

The study recommended that the future researches should be done with coordination of ophthalmologists and radiologists using the large sample of abnormal subjects.

مستخلص الدراسة

ان المعرفة بالقياسات الطبيعية للتصالب البصرى يساعد في الاكتشاف المبكر لبعض الامراض يمكن قياس ارتفاع وعرض التصالب البصرى باستخدام برمجيات الحاسب الآلي و التى تساعد في تقدير ابعاد التصالب البصرى حيث ان اغلب اجهزة الرنين المغنطيسى المتوفرة حاليا تحتوى على خاصية القياس .

الهدف من هذا البحث هو دراسة مقاييس التصالب البصري باستخدام صور الدماغ بالرنين المغنطيسي على مستوى المقاطع التاجية وقد أجريت هذه الدراسة في مستشفيات ولاية الخرطوم(رويال كير ومركز انطاليا الطبى ، (الخرطوم- السودان).

شملت عينة هذه الدراسة 205 سوداني ، 89 (43.4٪) منهم اناث و116 (56.6٪) ذكور. تتراوح اعمارهم (بين 16-78 سنة) تم تحويلهم إلى أقسام الأشعة في مستشفى رويال كير ومركز أنطاليا الطبي في السودان لعمل فحص الرنين المغنطيسي للمخ خلال الفترة من 2015 إلى 2018, تم تشخيص المرضى من قبل أخصائي الأشعة من ذوي الخبرة , حيث شخصت 172 حالة طبيعية ، 33 حالة لديهم تغييرات مرضية جميع القياسات تمت على مستوى المقطع التاجى لفحص الدماغ العام بالرنين المغنطيسي .

اوضحت الدراسه ان متوسط عرض التصالب البصري ± الانحراف المعيارى للمرضى الطبيعيين: 13.04 ملم ± 1.21 وكان متوسط الطول التصالب البصري ± الانحراف المعيارى:2.46 ملم ± 0.14 وكان متوسط عرض التصالب البصري ±ا لانحراف المعيارى للمرضى الغير طبيعيين: 13.32 ملم ±1.28 وكان الطول: 2.53 ملم ±0.184. كان متوسط عرض التصالب البصري جميع العينات الطبيعيين والغير طبيعيين: 13.08 ملم ±1.22 وكان الطول:2.47 ملم ± 0.514 .يتراوح معدل عرض التصالب البصرى للسودانيين بين 10.8ملم الى 12.15 ملم . ±1.2 وكان الطول بين 2.11الى 3.04 ملم ±0.15 .اى قياس للتصالب البصرى خارج هذا المعدل يعتبر خارج الاطار الطبيعى ويتطلب المزيد من الفحوصات واوضحت الدراسة ان ارتباط القياس مع النوع والعمر ليس له اعتبار إحصائي.

خلصت الدراسة بان قياس المعدل الطبيعى لابعاد التصالب البصرى باستخدام فحص الدماغ للرنين المغنطيسى يمكن استخدامه في حالة زيادة او نقصان الابعاد وهذه الدراسة اضافت معلومات اساسية ومهمة لأبعاد التصالب البصرى للسودانيين وسيؤثر ايجابا على التشخيص المبكر لبعض الامراض في المستقبل.

أوصت الدراسة بضرورة التعاون بين أخصائيى العيون والاشعة لاجراء البحوث المستقبلية مع ضرورة زيادة عينات الغير طبيعية مع اضافة بروتوكول لقياس التصالب اكثر وضوحا ودقة.

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List of Abbreviation

LGN	Lateral geniculate nucleus
ICA	intra cranial artery
ANCA	Antineutrophil cytoplasmic autoantibodies
MRI	magnetic resonance image
TB	tuberculosis
VZV	varicella-zoster virus
EBV	Epstein-Barr virus
ACTH	adrenocorticotropic hormone
TSH	thyroid-stimulating hormone
DTMRI	diffusion tensor magnetic resonance image
TON	traumatic optic neuropathy
FA	fractional aniosotpy
ADC	apparent diffusion coefficient
DTV2	diffusion tensor volume 2
MT	magnetization transfer
LSDI	line scan diffusion image
GRE	gradient echo
TOF	time of flight
FSE	fast spin echo
OC	optic chiasm

OT	optic tract
ON	optic nerve
MS	multiple sclerosis
GABA	gamma-aminobutyric acid
3D	three dimension
SE	spin echo
IR	inversion recovery
CT	computed tomography
FLAIR	fluid attenuation inversion recovery
EPI	echo planer imaging
TR	repetition time
TE	echo time
RCIH	Royal Care International Hospital
RGC	Retinal ganglion cell