

Dedication

*To my loving mother :**Aisha Mohammed Ahmed** ,for ...*

Her warm love ,care and support.

*To my husband Dr: **Yousif Ashamallah**, for*

His continue encouragement and Providing a good environment

through our life

*To my children **Mohammed, Gofran & Abobaker...***

To my beloved brothers & sisters...

to my friends and colleagues

With love and honor

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Abstract

This study was done to determine the ultrasonography characteristics in renal infections (glomerulonephritis and pyelonephritis) versus normal. This study carried out in Khartoum hospital, Madani hospital, Elmanagil hospital and Elkramit family health center, in those referred to urology department in the period from January 2014 to August 2016. A total of 234 patients were included in this study (106 were normal cases (22.6% male and 77.4% female) 128 patients had renal infections; 68 diagnosed with glomerulonephritis (38.2% males and 61.8% females) 60 with pyelonephritis (33.3% males and 66.7% females). Ultrasound scanning has been carried out, using a curve linear probe with a frequency of 3.5 to 5MHz. textural features were extracted from kidney medulla and calyche system using a window of 3×3 pixel of first order statistics. The result of this study reveals that female was mostly affected by

glomerulonephritis and pyelonephritis rather than male with male to female ratio of 1:1.6 and 1:2 respectively. Flank pain found in 82.4% associated with glomerulonephritis while 75% of pyelonephritis showed ill-defined corticomedullary differentiation. The overall accuracy using textural feature extracted from medulla was 98% while for those extracted from pelvic calyche system was 95.7%. In conclusion linear function was developed to classify other ultrasound images using textural features or ultrasonography characterizes with an error <4%.

المستخلص

أجريت هذه الدراسة لتحديد خصائص الموجات فوق الصوتية في التهابات الكلى (التهاب كبيبات الكلى والتهاب الحويضة والكلية) مقابل وضعها الطبيعي. طبقت هذه الدراسة في مستشفى الخرطوم، مستشفى مدني، مستشفى المناقل ومركز صحة الأسرة بالكريمت، في المرضى المحولين إليها من قسم المسالك البولية في الفترة من يناير 2014 إلى مايو 2016. في هذه الدراسة تم دراسة مجموع 234 مريضاً، 106 مريض غير مصابين بالتهابات الكلى (22.6% الرجال و 77.4% النساء)، 128 مريض كانوا مصابين بالتهابات الكلى، منهم 68 مصاب بالتهاب كبيبات الكلى (38.2% من بين الرجال و 61.8% من بين النساء) و 60 منهم مصاب بالتهاب الحويضة والكلية (33.3% الرجال و 66.7% النساء) وقد أجرى فحص الموجات فوق الصوتية باستخدام منحنى مسبار خطي مع تردد 3.5-5 ميغاهيرتز. تم

استخلاص الملامح التكوينية من نخاع الكلية وحوض الكلية باستخدام إطار من 3×3 بكسل لإحصاءات المرتبة الأولى. ونتيجة لهذه الدراسة تكشف أن النساء أكثر إصابة بالتهاب كبيبات الكلى والتهاب الحويضة والكلية من الرجال مع نسبة الرجال إلى النساء 1:1.6 و 2:1 على التوالي، 82.4% من المرضى يعانون من الم الخاصة المرتبطة مع التهاب كبيبات الكلى بينما أظهرت 75% من التهاب الحويضة والكلية عدم التمييز بين نخاع وقشرة الكلية.

كانت الدقة الكلية باستخدام المميزات التكوينية المستخرجة من نخاع الكلية 98% في حين لتلك المستخرجة من حوض الكلية 95.7%.

وفي الختام تم تطوير الدالة الخطية لتصنيف صور الموجات فوق الصوتية الأخرى التي تستخدم المميزات التكوينية أو الموجات فوق الصوتية مع وجود خطأ >4%.

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List of Abbreviations

Abbreviation	Phrase
BMI	Body Mass Index
BSA	Body Surface Area
GFR	Glomerular Filtration Rate
TBW	Total Body Water
CrCl	Creatinin Clearance
SrCr	Serum Creatinin Level
MC DK	Multi cystic Dysplastic Kidney
IVP	Intra Veins Pyelography
VUR	VesicoUreteral Reflux

AML	Angiomyolipoma
RCC	Renal Cell Carcinoma
TCC	Transitional Cell Carcinoma
IVC	Inferior Vena Cava
ARF	Acute Renal Failure
US	Ultrasound
ATN	Acute Tubular Necrosis
UTIs	Urinary Tract Infections
EPN	Emphysematous Pyelonephritis
CT	Computer Tomography
MRI	Magnetic Resonance Imaging
HIV	Human Immunodeficiency Virus
AIDS	Acquired Immune Deficiency Syndrome
MHz	Megahertz
Rt	Right
Lt	Left
Pt	Patient
GLCM	Gray Level Co-occurrence Matrix
CAD	Computer-Aided Diagnosis
EM	Expectation Maximization
3D	Three Dimension
SD	Standard Deviation
SGLD	Spatial Grey Level Dependence
IDL	Interactive Data Language
SPSS	Standard Statistical Package For The Social Sciences
CMD	Cortico Medullary Differentiation
Eq	Equation