

# Dedication

*To my mother, father*

*To my sisters and brothers*

*To my husband*

*To my son and daughter*

*To my teachers, and patients*

*To all those for their care,  
encouragement, cooperation and  
great support.*

# **Acknowledgment**

My grateful appreciation to my supervisor Prof:**Caroline Edward Eyad** for her careful supervision and valuable advice.

A lot of thanks to all people who helped me in this work, teachers, colleagues and patients.

Also I appreciate the great help and support of the ultra sound department in Jafar Ibnouf Hospital and Soba university hospital who were facilitate data collection , and to everybody who provide any kind of support or encouragement.

## *Table of Contents*

<b>Contents</b>	<b>Page No</b>
الآية	I
<b>Dedication</b>	II
<b>Acknowledgment</b>	III
<b>Table of contents</b>	IV
<b>List of Table</b>	VI
<b>List of Figures</b>	VII
<b>Abbreviations</b>	IX
<b>Abstract</b>	X
الخلاصة	XI
<b>Chapter One</b>	
<b>Introduction</b>	1
<b>Problem of study</b>	2
<b>Objectives</b>	2
<b>Importance of the study</b>	2
<b>Chapter Tow</b>	

<b>Embryology of the Urinary System</b>	3
<b>Anatomy</b>	4
<b>Physiology</b>	10
<b>Renal Sonography</b>	12
<b>Normal Sonographic Appearance</b>	13
<b>Pathology of the Urinary System</b>	17
<b>Previous Study</b>	39
<b>Chapter Three</b>	
<b>Material</b>	41
<b>Technique</b>	41
<b>Chapter Four</b>	
<b>Results</b>	43
<b>Chapter Five</b>	
<b>Discussion</b>	53
<b>Conclusion</b>	55
<b>Recommendation</b>	56
<b>References</b>	55
<b>Appendices</b>	57

## *List of Tables*

<b>Table NO</b>	<b>Description</b>	<b>Page No</b>
4-1	Distribution of sample according to age.	41
4-2	Distribution of sample according to sex.	42
4-3	Distribution of sample according to the kidney size.	43
4-4	Distribution of sample according to causes of kidney absence.	43
4-5	Relationship between right and left kidney echogenicity.	44
4-6	Relationship between right and left kidney pyramids.	44
4-7	Relationship between right and left kidney corticomedullary differentiation.	44
4-8	Relationship between right and left ureter.	45
4-9	Distribution of sample according to their urinary bladder wall thickness.	45
4-10	Distribution of sample according to their final diagnosis.	46
4-11	Distribution of sample according to other findings.	47
4-12	Distribution of sample according to obstructive uropathy causes.	48
4-13	Correlation between the final diagnosis and age group.	49
4-14	Correlation between final diagnosis and sex.	50

## *List of Figures*

<b>Figure NO</b>	<b>Description</b>	<b>Page No</b>
2-1	Relationships of the kidneys, suprarenal glands (adrenal), and vascular structures to one another.	5
2-2	The kidney cut longitudinally to show the internal structure.	6
2-3	Anatomic structures related to the anterior surfaces of the kidneys.	7
2-4	Vascular relationships of the great vessels and their tributaries to the kidneys.	9
2-5	Normal renal appearances at different ages.	14
2-6	Normal urinary bladder and ureter.	15
2-7	Renal agenesis.	16
2-8	Ectopic kidney.	17
2-9	Horseshoe kidney.	18
2-10	Multicystic dysplastic kidney.	18
2-11	Autosomal recessive polycystic kidney disease.	19
2-12	Longitudinal scan of mid-bladder base.	20
2-13	Acute tubular necrosis and nephrocalcinosis.	22
2-14	Chronic renal failure.	23

2-15	Pyonephrosis.	24
2-16	Xanthogranulomatous pyelonephritis.	25
2-17	Normal size of right kidney.	26
2-18	Renal vein thrombosis.	27
2-19	Ureteropelvic junction obstruction.	28
2-20	Posterior urethral valves in a male infant.	30
2-21	Hyperoxaluria.	31
2-22	Staghorn calculus.	32
2-23	Sonogram of urinoma	33
2-24	Acute glomerulonephritis	33
2-25	lupus nephritis	34
2-26	Chronic renal disease	35
2-27	Exophytic Wilms tumor.	37

## *Abbreviations*

<b>Abbreviations</b>	<b>Description</b>
cm	Centimeter.
ANP	Distribution of sample according to sex.
ADH	Anti Diuretic Hormone.
GFR	Glomerular Filtration Rate.
MHz	Megahertz.
MCDK	Multi Cystic Dysplastic kidney.
ARPKD	Autosomal resistive polycystic kidney disease.
ARF	Acute Renal Failure.
ATN	Acute Tubular Necrosis.
CRF	Chronic Renal Failure.
IV	Intra Venous.
<b>Rt</b>	Right Kidney
<b>Lt</b>	Left Kidney
<b>CMD</b>	Cortico Medullary Differentiation
<b>PUV</b>	Posterior Urethral Valve
<b>US</b>	Ultra Sound



## *Abstract*

This study has been conducted at Khartoum state hospitals, to document the common renal pathology among the Sudanese children by using ultra sound as diagnostic imaging modality, during the period from March 2017 to August 2017. The study included 80 children aged 3 month to 18 years, with a mean age of 10 years. Male patients were 57, 5% and female were 42.5 with Male : Female ratio 1.35:1 .

All the patients were examined by using convex probe of frequency 5 Megahertz, and some of them examined by using linear probe 12 megahertz. All examinations were performed in supine and prone positions. Data were collected in data collection sheet.

The results of the study showed that common renal disease which is detected sonographically were: Renal parenchymal disease(31.3%),chronic renal failure(22.5%),obstructive uropathy(17.5%),acute renal failure, lupus nephritis and posterior urethral valve had a same percentage of(6.3%), renal tumors' (2.2%),renal agenesis ,renal atrophy and urinary bladder lishmaneciasis were( 1.3%)

The study conclude that it would be better to do the ultrasound scan as a routine investigation in the urinary tract problems in Sudanese children in order to detect the lesions as a cause of urinary tract problems as well to confirm the cause of hydronephrosis and follow up. This will help in management and control of the disease.

## الخلاصة

أجريت هذه الدراسة بمستشفيات ولاية الخرطوم لتحديد نتائج فحوصات الموجات فوق الصوتية المتعلقة بأكثر أمراض الجهاز البولي شيوعا لدي الأطفال السودانيين. في الفترة من مارس 2017 حتي أغسطس 2017.

هذه الدراسة شملت 80 طفلا في الأعمار ما بين 3 أشهر – 18 سنة مع 10 سنوات بمتوسط عمري لعينة الدراسة, نسبة الذكور كانت 57,5% ونسبة الإناث 42,5% .

تم تقييم جميع الحالات المرضية باستخدام أجهزة موجات فوق الصوتية و مجس محدد بتردد 5 ميغاهرتز و بعض الحالات تم تقييمها بواسطة مجس خطي بتردد 12 ميغاهرتز, جمعت البيانات في جدول جمع البيانات.

أظهرت نتائج الدراسة ان اكثر الأمراض شيوعا في الجهاز البولي عند الأطفال السودانيين التي تم رصدها بواسطة الموجات فوق الصوتية هي : أمراض الكلي المتنية بنسبة 31.3% , فشل الكلي المزمن 22.5% , الإعتلال البولي الإنسدادي 17.5% , فشل الكلي الحاد , إلتهاب الكلي الذأبي و صمام الإحليل الخلفي , كانت بنسبة 6.3% , أورام الكلي 2.2% , عدم تكون الكلي و ضمور الكلي و داء لشمانيا المثانة البولية بنسبة 1.3% .

خلصت الدراسة إليضرورة إعتقاد الفحص بالموجات فوق الصوتية كإجراء روتيني للأطفال الذين يعانون من مشاكل الجهاز البولي للكشف عن أسباب آفات الجهاز البولي و متابعة الحالة للمساعدة في العلاج.

