## List of Contents

Introduction		
Aim of the work	3	
Review of literature	4	
Historical development of ESWL	4	
Physics of ESWL	6	
Mechanism of stone fragmentation	15	
Indications of ESWL	17	
Contraindications of ESWL	18	
Pathogenesis of pain during ESWL	20	
Petroleum jelly and ESWL related pain	20	
EMLA cream in ESWL	23	
Residual stone fragments	24	
Patients and methods	30	
Results	37	
Discussion		
Summary and conclusion	56	
References	58	
Arabic summary		

## List of Tables

No.	Title	Page
1	Historical background of extra corporeal shock wave lithotripsy (ESWL)	5
2	The comparison between the three studied groups regarding age	37
3	The comparison between the three studied groups regarding sex	37
4	The comparison between the three studied groups regarding side of stone	38
5	The comparison between the three studied groups regarding stone size	38
6	The comparison between the three studied groups regarding solitary renal stone site	39
7	The comparison between the three studied groups regarding hydrohephrosis	40
8	The comparison between the three studied groups regarding number of shots	41
9	The comparison between the three studied groups regarding pain score	42
10	The comparison between the three studied groups regarding need of anaesthesia	43
11	The comparison between the three studied groups regarding final results	45
	three months after the last ESWL session	

## List of Figures

No.	Title	Page
1	Schematic view of an electrohydraulic shockwave generator	7
2	Schematic view of an electromagnetic shockwave generator that uses an acoustic	8
	lens to focus the shockwave.	
3	Schematic view of an electromagnetic shockwave generator that uses a parabolic	9
	reflector to focus the shockwave	
4	Schematic view of a piezoelectric shockwave generator	10
5	Summary of how the various mechanical forces generated by a lithotripsy	17
	shockwave might cause a kidney stone to fracture	
6	Dependence of lower caliceal collecting system (minimal dependence)	27
7	Dependence of lower caliceal collecting system (very dependant lower calyx)	27
8	Infundibulopelvic angle according to Elbahnasy et al., (1998)	27
9	The comparison between the three studied groups regarding solitary renal	39
	stone site.	
10	The comparison between the three studied groups regarding hydrohephrosis	40
11	The comparison between the three studied groups regarding pain score	42
12	The comparison between the three studied groups regarding need of anaesthesia	43
13	The comparison between the three studied groups regarding final results	45
14	(a) KUB of a patient with left renal pelvic stone	46
	(b) IVU of the same patient without hydronephrosis	47
	(c) KUB of the same patient 3 months after the last ESWL session showing	
	complete stone clearance	47
15	(a) KUB of a patient with right renal pelvic stone	48
	(b) IVU of the same patient with minimal hydronephrosis	48
	c) KUB of the same patient 3 months after the last ESWL session showing	
	complete stone clearance	49
16	(a) KUB of a female patient with left renal pelvic stone	49
	(b) IVU of the same patient without hydronephrosis.	50
	(c) KUB of the same patient 3 months after the last ESWL session	
	showing complete stone clearance	50