Frontiers in Health Informatics www.healthinformaticsjournal.com
ISSN-Online: 2676-7104
2024; Vol 13: Issue 2 Open Access

THE ADVANTAGE AND DIS- ADVANTAGE OF DIURETICS ON FRAGMENTATION AND CLEARANCE OF STONES AFTER EXTRA CORPOREAL SHOCK WAVE LITHOTNPSY

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Abstract
Uretral stone was common urological problem in field of urology mostly treated by extra corporeal or ureteroscopy with lithotripsy or medical mangment.
Our research is effect of furesamide (a diuretic medication _ (lasimax 40 mg) on the clearance of urinary stone after shoot of (ESW) in our research there was increase in fragmented stone (1.02 _ 1.04 , p= 0. 02) but there is no ettect in stone cleaning with the control groups (0.95 _ 1. 51 , p= 0.08) .
There is decrease in the number of ESW needed by used of lasi.max
Keywords: Diuretics and Stone Clearance.

Introduction
Stones of the urinary system is common disease and affected 1_5% of Asian people . in spite of
Increases prevalence also there was increase in recurrence along by increasing in age 45% in 54 years to 72% in 20 years.
Short term symptoms was :
1. Server colicky pain.
Na .2usia with or with out vomiting .
Haematuria .3
Longterm symptom was :
1. Renal parenchymal damage .
2. Hydronophrosis with or without hydro ureter.
3. Urinary obstruction
features of ESW wainly ,
A. invasive maneuver.
b. Not need anathesia .
c. Gold standard for stone less than (2 Cm).
d. Increase patient agreement.

Adverse effect of ESW mainly :
1- Need more sessions.
2- Increase residual stone .
3- Result not acutly present .
4- Increasing the clot .
5- Growing of fragmented stones.
6- Associated with sever colicky pain .
7- Stop on quality of life .
So many urologest used medication for success of clearance of stones and reduce obstruction and other complication.
The medication used like :
1. Calcium channel blockers .

2. Progesterone .
3. Adrenergic blockers .
4. Non steroid antiinflamatory drugs.
5. Diuretics .
6. Potassuim citrates.
7. Covering Antibiotic .

Materials and Methods :

This research comes from information taken from patients undergo , ESW with furosemids (40 mg)
After thes essions in al-karhk ge neralho spital the criteria of inclusion were as follow:
.Comparism …. Between.

1.Patient taken lasimax and without taken.
2 Delaying of study .
. 3. Information required for analysis.
4. Information availability .

Data extracted from :
1. Patient number .
2. Patient age .
3. Patient gender .
4. Type of stone .
T .5 ype of investigation .
6. Fragmented stone .
7. Clearance of stone .
8. Number of shock. s
9. Number of sessions .
Data Collection

Data collected from patient from ESW unit in urology department in al KARKH general hospital from 2017 to 2020 .
Total number of patiend was (351) patieuh divided into group receive (40 mg) of lasimax at beginning of ESW while second group receive (20 mg) of lasimax at beginning of shoters .
The shocks used of the frequency of 90 per minute start up at 9 KV with escalated does increase to 18 KV till fragmentation of stone or till reach of 1,500 or 2,000 shocks for real stone on upper ureteric stone per session till to 3 session.
About clearance of stone show change between group (0.91 _ 1.52, p= 0.08) but heterogenity obvious 70% , p= 0.01).
About stone fragmantation was increased by use of lasimax by 1.03 to 1.05, p=0.02) with No clear heterogenity 0 % , p=0.4) .
The number of sessions not obviousaly affacted by lasimax (a mean number of 2.13 _+ 1.15 and control)
Group 2.2 _+ 1.4 (p< 0.05)respectively also the total number of shocks the same No significant affect by total number 3.68 _+ 1.91 and 2.22 (p<0.05) respectively .
The outcome of clearance of stone by diuretic (1.1_1.23 , p=0.02) with very important to

evaluated the result stability .

Results

ESW is most model of treatment of real and uretral stones , repeated sessions lead colicky pain due to large stone impaction .

The successful of ESW depend on the following :

1. Stone location .
2. Stone size .
3. Stone composition .
4. Degree of obstructed kidney .

Re .5nal function unit .

6. Stenting of ure. ert
7. Usage of Diuretic by most of textbooks . written (so ESW improved renal).

Stone fragmentation) .by these meananism :

1. Diurctic causes fluid film which form a layer on area of stone lead to increase of success rate .
2. Permeation of fluid into stone increases after shell of stone damaged by shocks caused by diuretic.
3. Diuretic enhanced fragmeted stone so can lead to decreases total number of session of shocks .

So diuretic can reduce time required for clearance of stone but not improved in clearance of stone in long term after many session of ESW .

Conclusion

1. Diuretic used after ESW session lead to more success rate .
.2Diuretic lead to significant fragmantation of stone .
3. Diuretic lead to decrease total number of session .
4. Stone clearance by diuretic was insignificant.

FIG 1

Picture of search of study with processing select.

Study	Design	Therapy		Location of ureteral calculus	Type of lithotripter	Sample size		Follow-up	Exclusion criteria
		Control	Experiment (dose)			Control	Experiment		
Azm TA 2002	RCT	SWL	SWL+ Furosemide (40mg)	ureter	Siemens Lithostar 2 machine	54	52	3 mo	Not mentioned
Zomorrodi A 2008	RCT	SWL	SWL+ Furosemide (40mg)	ureter	Simons Lithostor plus machine	43	44	3 mo	Not mentioned
Ahmed AF 2015	RCT	SWL	SWL+ Furosemide (20mg)	renal	Dornier lithotripter SII, Dornier MedTech, Wessling	100	100	3 mo	Patients with morbid obesity, musculoskeletal disorder, severe cardio-vascular or neurological diseases, previous failed SWL, UTI, elevated serum creatinine, uncontrolled coagulation disorders, abnormal renal anatomy, severe hydronephrosis, obstructed calyx or urinary tract obstruction at any level in the ipsilateral renal unit.
Kocaaslan R 2015	RCT	SWL	SWL+ Furosemide (40mg)	renal	Modularis Vario Lithostar; Siemens Medical Systems, Elangen	72	69	3 mo	Previous renal and/or ureteral surgery, multiple stones, ureteral or ureteropelvic junction stricture, congenital ureteral and/or renal abnormalities, renal insufficiency, a solitary kidney, or had hydronephrosis of grade II or greater, as found by intravenous urography. Those who were pregnant, allergic to furosemide, or had active coagulopathy, cardiac disease.
Sabharwal S 2017	RCT	SWL	SWL+ Furosemide (40mg)	renal or upper ureteric	Dornier MedTech GmbH, Weßling, Germany	48	48	2 wk	Those with any anatomical abnormality, distal obstruction, coagulopathy, history of any previous intervention on the same side, significant cardiac history or morbidly obese.
Sohu S 2019	RCT	SWL+ 1000 mL 0.9% NaCl	SWL+ 1000 mL 0.9% NaCl+ Furosemide (40mg)	renal	Dornier MedTech, Munich, Germany	357	357	3 mo	Patients with any anatomical abnormality, uncontrolled coagulopathy, untreated UTI, previous renal and/or ureteric surgery, ipsilateral ureteric stone, multiple or bilateral stones, congenital ureteric or renal abnormalities, renal insufficiency, cardiac disease, known hypertensive or morbidly obese. Additionally, patients with history of allergy to furosemide and pregnant women were also excluded.

RCT = randomized controlled trials, SWL = shockwave lithotripsy, UTI = urinary tract infection.

Characteristics of randomized controlled trials included in the present meta-analysis.

Picture showing rate of fragmentation of them.

FIG 2

Table 2: The result of stone fragmentation and clearance

	Upper		Middle		Lower	
	G1	G2	G1	G2	G1	G2
Number of patient	17	15	6	7	20	22
Average every pulse session	3500	3500	3500	3500	3500	3500
Fragmentation	13 76/4%	14 93/3%	4 66/6%	6 85/4%	18 90%	21 95/4%
Clearance	10 58/8%	13 86/6%	2 33/3%	5 71/4%	16 80%	21 95/4%

Fig 3
Picture showing rate of clearance of stone.

Picture showing rate of analysis sensitivities some clearance of stone .

Table 1: Number of patients and location of stone in the study groups

	1st Group	2nd Group
Number	43	44
Location of stone (Lower–Middle-Upper)	20-6-17	22-7-15
Size of stone	8-16 mm	10-18 mm

Fig 4

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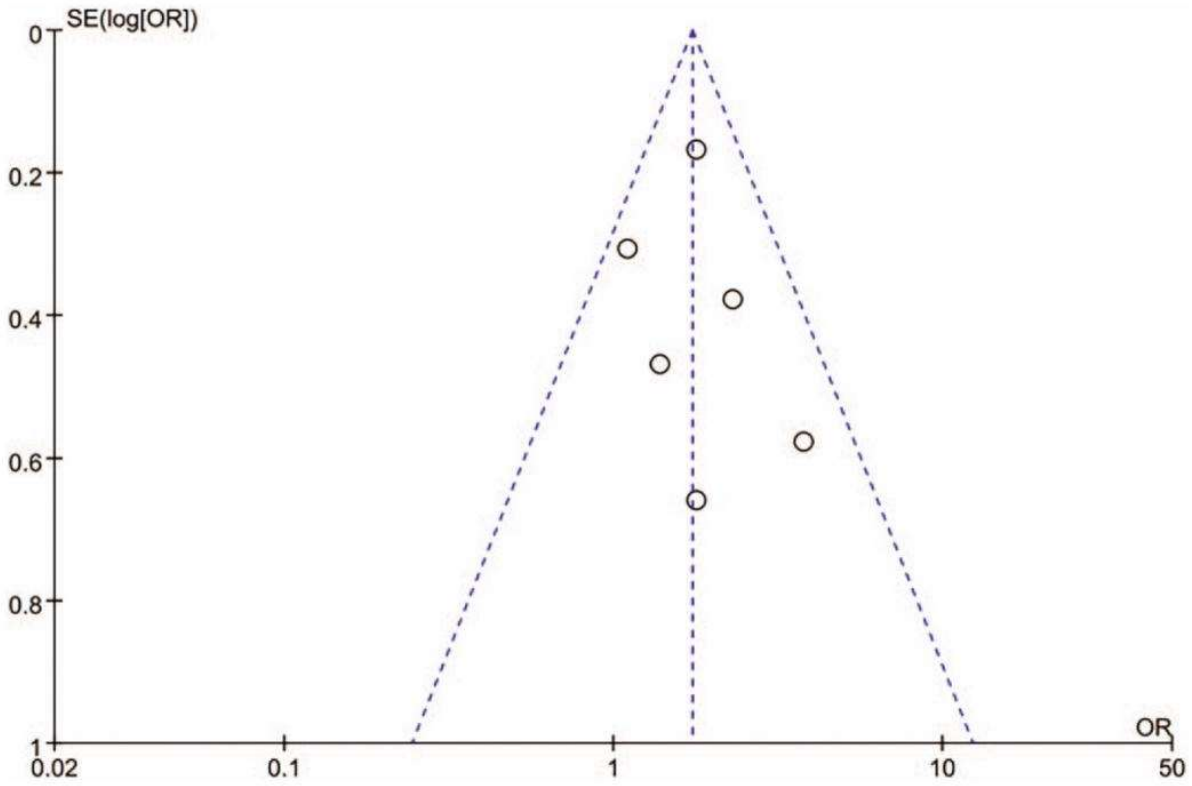

Funnel plot of the studies represented in our analysis. OR=odds ratios, SE=standard error.

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