Amount of liquid taken doesn't effect the swl's success in the upper ureteral stones

Üreter üst bölüm taşlarında eswl'nin başarılı olmasında alınan sıvı miktarı etkili değildir

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Özet

Amaç: ESWL uygulanan üreter üst bölüm taşlı hastalarda işlem sonrasında farklı miktarlarda sıvı alınmasının taştan arınma oranlarına etkisi olup olmadığını araştırmak.

Gereç Yöntem: Üroloji polikliniğine radyoopak üreter üst bölüm taşı nedeni ile başvuran ve ESWL planlanan hastalar çalışmaya alındı. Hastaların taş boyutu, ESWL şok sayısı, enerji miktarı, hastaların kiloları ve boyları kaydedildi. İşlem sonrasında hastalar 3 gruba ayrıldı. 1. Gruba günlük 1500 cc, 2. Gruba günlük 3000 cc su ve 3. Gruba günlük 4500 cc su almaları telkin edildi. Hastalar işlemden ortalama 11,8(3-52) gün sonra kontrol edildi. Kontrol DÜSG ile yapıldı. Hastaların taşsız olup olmadıkları kayıt altına alındı. İstatistik değerlendirmesi SPSS 16.0 (Chicago, Illinois, USA) ile yapıldı.

Bulgular: Çalışmaya Temmuz 2012 ile Temmuz 2014 tarihleri arasında 55 hasta alındı. 1. Grupta 24, 2. Grupta 18 3. Grupta 13 hasta vardı. Hastaların gruplara göre taş boyutları, ESL şok atım sayısı, uygulanan enerji miktarı, kiloları farklı değildi(p=0.673,0.094,0.295). Kontrol esnasındaki taşsızlık oranları arasında farklılık saptanmadı.. (p=0.960).Grup1-2 p=0.151; grup 1-3 p=0.507; grup 2-3 p=0.537 ikili karşılaştırmada da fark saptanmadı. (Mann Whitney U test)

Sonuç:Üreter üst bölüm taşlarında ESWL sonrasında günlük su alımını 1500 cc'den 4500 cc'e arttırmak başarı oranlarını arttırmıyor gibi gözükmektedir.

Anahtar Kelimeler: Üreter taşı; ESWL; Su

Abstract

Objection: To investigate whether taking different amounts of liquid after the SWL procedure effects stone clearance rates in patients with the upper ureteral stones.

Material and Methods: Patients who had radiopaque upper ureteral stones that planned SWL treatment enrolled in the study. Stone size, count of SWL shock, the amount of energy, weight and height of patients were recorded. After the procedure, patients were divided into 3 groups. Group 1:Daily 1500 cc, group 2:Daily 3000 cc, group 3:Daily 4500 cc water intake was suggested. Patients were checked after processing an average of 11.8(3-52) days.Control was done with plain abdominal radiography. Stone clearence was recorded. Statistical evaluation was made with SPSS 16.0 (Chicago, Illinois, USA).

Results: Between July 2012 and July 2014, 55 patients were included in the study.There were 24 patients in group 1; 18 patients in group 2; 13 patients in group 3. Stone size according to the groups of patients , the number of SWL shocked at the amount of energy applied and weight did not differ(p=0.673,0.094,0.295). There was no difference for stone clearence during control(p=0.960). Grup1-2 p = 0.151; group 1-3, p = 0.507; group 2-3, p=0.537 In binary comparison there was no significant difference. (Mann-Whitney U test)

Conclusions: It does not seem to increase increase the success rate of stone clearence by increasing the daily water intake from 1500 cc to 4500 cc after SWL in patients with the upper ureteral stones.

Introduction

Medical expulsive therapy (MET), shock wave lithotripsy (SWL), ureterorenoscopy(URS), percutaneous antegrade ureteroscopy (PAU), laparoscopic and open stone surgery are used for upper ureteral stone's treatment(1). Being minimally invasive and for high success rate, SWL is the first option for less than 10 mm stones(2,3). According to EAU 2014 guidelines, SWL success depends on the effectiveness of the device, stone size, location, stone composition and SWL effectiveness(3).Nonetheless, regardless of SWL's effectiveness, the real success is measured by the clearence of the stones. The probability of stone clearence is inversely proportional to stone size and lumen diameter(4). It is certain that fluid intake is beneficial for stone clearence and is always recommended for patients in our daily practice. But there is no study and research on the quantity of liquid to be consumed. In our survey we researched the effects of fluid purifying upper uretery stones after effective and successful SWL.

Material and Methods

Our study initiated as a prospective and single-centered after receiving consent from the local ethics committee. Patients enrolling to urology outpatient clinic with radiopaque upper uretery stone complaint and designated for SWL were included in this study. Patients were evaluated according to plain abdominal graphy, intravenous urography and ultrasonography results. For SWL device, electromagnetic generator, Siemens brand Lithoskop© with fluoroscopy and ultrasound focus module SWL device was used. SWL started with 90 shocks / min at the rate of 0.1 joules of energy and gradually maximised up to a maximum value of 4 joules of energy. Stone-free patients with fragmented stones were concidered as successful. Stone size, number of SWL shocks, the amount of energy, weight and height of the patients were recorded. After the procedure, patients were divided into three groups:For Group 1: 1500 cc water, Group 2: 3000 cc water, Group 3: 4500 cc water per day was recomended. Each patient was given the same sets of medical expulsive alpha-blocker therapy with anti-inflammatory drug. Patients were checked after 11.8 days by plain abdominal radiography and ultrasonography. Patients were recorded as stone-free or not. Being stone-free status was regarded as an indicator of success. Moreover, the height and body mass index (BMI) of the patient and stone size were also evaluated for accomplishment rate.

Statistical Analysis

Statistical analysis was conducted according to SPSS 16.0 (Chicago, Illinois, USA).

Result

55 patients were included in the study between July 2012 and July 2014.The patients' mean age was 37.74

Table-1. Stone size of the groups

	1500	3000	4500	P*
Mean stone size	9.58	9.05	7.30	0.088
Standard deviation	3.67	3.90	2.42	
Median	8.5	8.0	7.0	
N	24	18	13	

Kruskal Wallis test

Table-2. SWL shock frequency, power level, weight of groups

	1500	3000	4500	P**
SWL shock frequency	3000	3000	3000	0.673
Power level	58.77	60.29	71.42	0.094
Weight	80.50	80.0	68.0	0.295
n	24	18	13	

*Median Values ** Kruskal Wallis test

Table-3. Accomplisment Rate

	1500	3000	4500	P*
Successful	18	15	5	
Unsuccessful	6	3	8	0.960
Total	24	18	13	

*Kruskal Wallis test

Table 4- Accomplishment Rate in terms of height

		Success		Total	P
		Unsuccessful	Successful		
Height	<175	9	23	32	0,653
	≥175	8	15	23	
Total		17	38	55	

Table - 5 Accomplishment according to BMI

	Success		Total	P
	Successful	Unsuccessful		
<25	18	6	24	0,505
>25	20	11	31	
Total	38	17	55	

Table-6 Accomplishment according to stone size

		Success		Total
		Successful	Unsuccesfull	
Stone Size	<10 mm	26	9	35
	>10mm	12	8	20
Total		38	17	55

± 14.54. The avarage height 172.7 cm. and the average weight 76.25 kg. and mean BMI was 25.49. Mean stone size was 8.87±3.55 mm. 47 patients were male and 8 patients were female. Avarage shock number applied was 2715.3 ± 528. Average applied energy was 58.20 ± 18.15 joule. Thirty three of 55 patients with an average follow-up of 11.8 ± 9.1 (3-52 days) remained stone-free (69%).

Patients were divided into three groups according to the water consumption.There were 24 patients in Group 1; 18 patients in Group 2; 13 patients in Group 3. Stone size of the groups was 9.58 ± 3.67mm in Group 1, 9.05±3.90mm in Group 2, 7:30 ± 2:42 mm in Group 3 (Table 1).There were no variations between the groups in terms of stone size (p = 0.088) SWL number of shocks, amount of energy applied, patients' weight (Table 2).In addition no variation was observed in the stone-free status during the follow up (p = 0.960) (Table 3).There were no significant differences in their stone-free status when the groups were considered separately: Grup1-2 p = 0.151; group of 1-3 p = 0.507; group of 2-3 p = 0.537 (Mann-Whitney U test).

As the patients, were divided into two groups as: higher or shorter than 175 cms , no difference in terms of stone clearence was observed (Table 4).

When the patients were grouped according to their body mass index (BMI) as: BMI over 25 and BMI below 25, no difference was seen between these groups in terms of stone-free status (Table 5).

When the patients were divided into two groups according to their stone size as: over 10 mm or below, numerically significant variation was observed, but no statistical difference (p = 0.270) (Table 6).

Discussion

Shock wave lithotripsy is based on breaking the urinary stones by focusing sound waves passing through the soft tissues(5). HM3 lithotripter was made in 1983 by Dornier and the units became widespread after the FDA's approval in 1984. SWL is used in many parts of the urinary tract. For stones less than 10 mm in the proximaly uretery, SWL is the first option. Ureterorenoscopy or SWL may be preferred for he stones above 10mm. Stone clearence after SWL is affected by factors such as stone size, stone duration and stone content.

Success for proximally ureteral stones less than 10 mm is 84%, whereas 72% in stones over 10 mm(2). In our study, there were stone sizes up to 20 mm. The success of this study seems to be low according to this literature. However, the success varies between 32-51% in recent studies where stone sizes are over 10 mm(6,7,8).

Several medical expulsive therapy can be carried out for ureteral stones after SWL or without SWL procedure(9,10,11,12). Alpha blockers and anti-inflammatories are two good examples(13). Theoretically, hydration is mentioned to be beneficial for this therapy. However, there is inadequate data on the quantity to be taken. Clinicians suggest the patients drinking a lot of water. Patients who dislike to drink water or can not because of nausea created by uretery stone enforces themselves for drinking water. What is the measure or limit of much fluid? For how much patients should force themselves.

European food safety agency in 2010 suggested for females drinking 2 liters of water per day and males 2.5 liters a day(14). Of course, high fluid intake prevents the stone recurrence(15) . But no study so far, mentioned the limits of fluid intake. In our study, patients with same stone size, same energy and shock numbers applied and same weight were evaluated after successful SWL. Patients were recomended to drink 1500, 3000 and 4500 cc of water. Our study was the only and the unique example to research the effects of water intake to the stone clearence after a successful. SWL as a result; no difference between the three groups in terms of stone clearence was noted. This proved us that is no use of forcing patients to drink too much water.

Again, this study revealed that parameters, such as patient's height, BMI and stone size do not contribute to stone clearence in proximal uretery stones after SWL procedure.

The literature depicted that success rates decreases after SWL, as the stone size increases(16). Although a numerical difference was seen our study but no statistical significance was observed.

The most important limitation to our study; was the small number of patients. However, this is a compulsory stuation because similar loci and stone sizes and successful SWL and fragmentation cases were included in the study. Another restriction was being unable to follow the patients liquid consumption. Determination of extracted urine could be helpful. However, this evaluation will be low patient compliance.

In conclusion maximizing daily water intake from 1500 cc to 4500 cc doesn't seem to supplement success rate in proximal uretery stones after successful SWL procedure.

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