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ORIGINAL ARTICLE

Role of Triple D Score in Eswl: Our Experience at Urology Department Chandka Medical College Hospital Larkana Pakistan

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ABSTRACT

Aim: To detect usefulness of triple D score in ESWL (extracorporeal shock wave lithotripsy) for management of renal stone.

Methodology: Retrospective Study was conducted at Urology department, CMCTH) at SMBBMedical University Larkana. 50 patients underwent ESWL from 2018 to 2020. All the related data were taken as well as demographic details, history and risk factor from the patients. Routine investigation carried out including Blood CP ESR, Urine DR, Blood sugar, Renal profile, urine culture sensitivity and CT KUB. The stone density, skin-to-stone distance, and stone size were calculated by a radiologist.

Results: ESWL was performed on 50 patients with average age of 30± 8 years and a sex ratio (male female) of 1:0.3. The stone-free percentage after the first treatment session was 40 percent and 90 percent on 2nd sitting, based on the triple D score, which included stone size, skin to stone distance, and stone density (HU). The mean stone size was 15.8 mm, the Skin to Stone Distance was 6.4 cm, and the stone density was 594 HU were established respectively.

Conclusion: The Triple D Score is easy to compute and reported by radiologist. The use of the Triple D Score in ESWL patients has been shown to improve overall ESWL success rates.

Keywords: Extracorporeal, Shock, Wave, Lithotripsy, Renal stone and Triple D score

INTRODUCTION

Globally, renal stones are one of the most frequent urological problem. Geographically, occurrence and composition of stone is different. In Europe, the prevalence ranges from 5 to 9 percentage, in North America, from 7 to 13 percentage, and in Asia, from 1 to 5 percentage.[1,2] A higher frequency has been seen in South Asia, notably Pakistan, because to excessive exposure to sunshine and hot temperatures. Calcium oxalate 75 percent% and hydroxyapatite 25 % are the most common components of upper urinary tract calculi in pakistan. Medical expulsive therapy, ESWL, Uretroscopic stone extraction, PCNL, Open surgery, and a combine treatment procedure are among the treatment options for urolithiasis.[3,4] Though, in most cases, EWSL is a non-invasive surgery that is preferred for the management of renal stones, particularly where the stone diameter below the 2cm.[6,7] The majority of renal stones in both adults and children are treated with first-line therapy. Now a day recent studies showed role of Triple D score, which includes stone density, skin to stone distance (SSD), and stone diameter, determines the success rate of ESWL so our aim to see the role of 3D score in ESWL.[8]

METHODOLOGY

This study was performed at Urology dept: CMC(Hospital) SMBB Medical University Larkana during the period of july 2018 to December 2020. Fifty (50) patients with mean age 30+ 8 and male female ratio 1: 0.3 underwent ESWL from 2018 to 2020. . All the related data were taken as well as demographic details, history and risk factor from the patien. Routine investigation carried out including Blood CP ESR, Urine DR, Blood sugar, Renal profile, urine culture sensitivity and CT KUB. The stone density, skin-to-stone distance, and stone size were calculated by a radiologist to see the success rate of ESWL.

RESULTS

ESWL was performed on 50 patients with average age of 30± 8 years and a sex ratio (male female) of 1:0.3. The stone-free percentage after the first treatment session was 40 percent and 90 percent on 2nd sitting, based on the triple D score, which included stone size, skin to stone distance, and stone density (HU).

Table 1: Parameters of 3D score in ESWL

Mean Stone Size	15.8 mm
Mean Skin to Stone Distance	6.4 cm
Mean Hounsfield units	594

The mean stone size was 15.8 mm, the Skin to Stone Distance was 6.4 cm, and the stone density was 594 HU were established respectively (Table No.1).

DISCUSSION

Beginning of ESWL in 1980s' has established as a secure and effective therapy for renal stones. ESWL therapy have approximately, 85 to 90 percent successful management rate of renal stone.[9] The skin-to-stone distance, stone size, and HU of renal stones have all been shown to be predictive of ESWL outcome in several trials. Due to introduction of Triple D score in the management of kidney stones by ESWL, the success rate of clearance has improved.[10] The three components of Triple D score including skin to stone distance, stone density and stone diameter which can be easily accessed on C.T and can be reported by radiologist. Bigger stones are linked to a higher chance of treatment failure for urinary tract stones. Following ESWL, stone size is an independent predictor of stone-free rate, according to a research by Snicorius M et al.[7] Patients with stones > 15 mm have been observed to have a higher failure rate with ESWL. The average stone size in our study was 15.8 mm, which is consistent to Snicorius M et al[7] findings.

A relationship between stone attenuation and stone fragility was established in vitro for the first time. More shockwaves are required for stone breakup as the attenuation value of calcium stones enhances. In study, patients with calculi more than 750 HU were 10.5 times more likely to require 3 SWL treatments. while than those with calculi equal or less than 750 HU. Study reported that, calculi below 1,000 HU reported a 95% success rate, compared to 55% for stones over 1,000 HU ($p<0.01$). When renal calculi ranges from 750 to 1,000 HU, seemed most likely failed in ESWL, according to several studies, and these patients should be examined for other therapeutic options. In our study, the mean HU was 594 which is comparable to the research of Ozgor F et al.[11] SSD has been found to be a major predictor of renal stone formation by a number of researchers. SSD was found to be a major predictor of lithotripsy success for renal stones by Wiesenthal et al. SSD, >10cm was found to be a major predictor of outcome in several studies and agreed with with failure rate while SSD of less than 9 cm was found to be a good predictor of SWL success. SSD was 6.4cm in our study, which was a major predictor of treatment end result, similar to Wiesenthal et al. and Cui HW et al.[5,12]

CONCLUSIONS

The triple D score is easy to compute by radiologist on CT KUB and use of triple D score in ESWL patients has been shown to improve overall SWL success rate.

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