

Interim Analysis of a Sham-Controlled Randomized, Prospective Study Using Low Intensity Shockwave Therapy (LiSWT) for Improvement of Erectile Function

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keywords: low intensity shockwave therapy, erectile dysfunction, grayscale, hypoechoic regions, corpora cavernosa

Introduction: The Urogold 100 MTS™ electrohydraulic shockwave device is FDA cleared for improved blood flow and connective tissue activation; retrospective studies in ED patients have shown positive outcome.

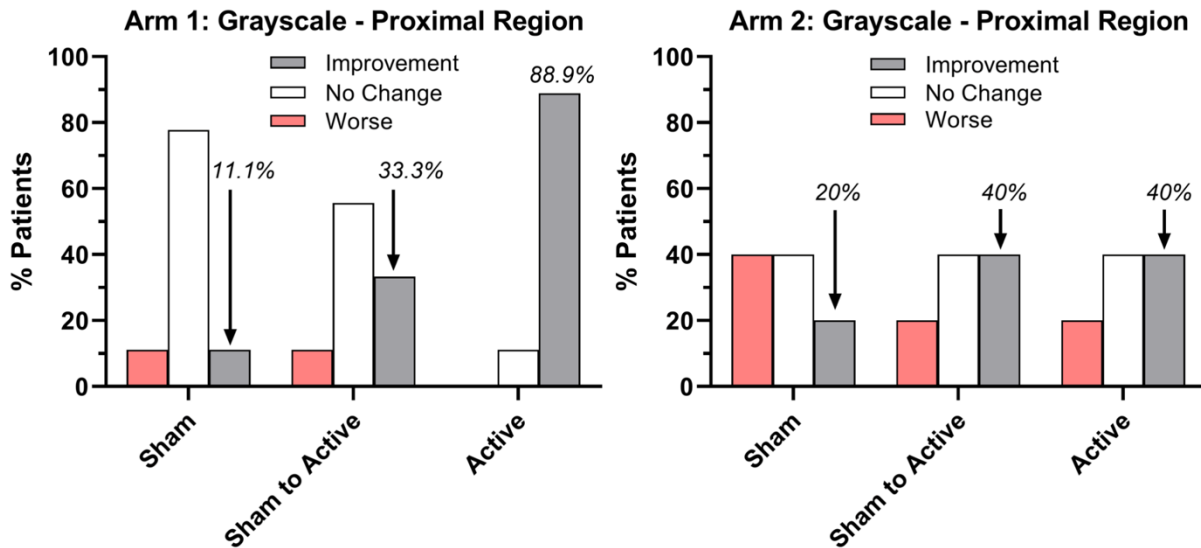
Objective: To perform an interim analysis of sham/active treatment changes in primary outcome measures of grayscale ultrasound and DUS.

Methods: A single-blind, sham-controlled, randomized, prospective study in men with ED naïve to acoustic wave therapy was performed. Those meeting inclusion/exclusion were randomized to one of two treatment arms and assigned to active or sham, 2:1 within each arm. Arm 1 consisted of three treatments of 5000 shocks every three weeks, 4 Hz, 0.12 mJ/mm²; arm 2 consisted of 5000, 3000 and 3000 shocks, 4 Hz, 0.12 mJ/mm²; weeks one, two and three respectively, three weeks without treatment, then repeat treatments every three weeks. First follow-up was 20 weeks after initial treatment; DUS and grayscale imaging using a 15.4 MHz probe were repeated under pharmacologic erection 3-4/4 hardness. Post-treatment grayscale percent hypoechoic regions within the corpora cavernosa were assessed: none (0), mild (1), moderate (2) and severe (3) and compared to baseline. Post-treatment EDV and PSV were compared to baseline. Upon completion subjects were unblinded. Subjects assigned to sham were crossed over to the opposite arm for active treatment. Subjects initially in active treatment underwent a second follow-up 32 weeks after initial treatment. Data from each treatment arm were analyzed by two-way repeated measures ANOVA with Geisser-Greenhouse correction. Follow-up pairwise comparisons to baseline were performed using Dunnett's multiple comparison test. In subjects with one on-treatment assessment, missing data due to early discontinuation from the study were imputed by the "last observation carried forward" method.

Results: Powered for 60 subjects, recruitment was stopped (COVID) after randomizing 36 subjects (22 active, 14 sham). The proximal penis exhibited greatest improvement (decreased heterogeneity score) on grayscale. The number of subjects with improved erectile tissue grayscale ratings in the proximal region was consistently higher in active treatment versus sham groups (Arm 1 = 88.9% vs. 11.1%; Arm 2 = 40.0% vs. 20.0%, respectively). Sham subjects rolled over to active LiSWT also had improved grayscale ratings (Arm 1 = 33.3% vs. 11.1%; Arm 2 = 40.0% vs. 20.0%). Change in heterogeneity was statistically significant for the proximal region in active treatment Arm 1 at both Week 20 (p=0.005) and Week 32 (p=0.001). Mean IIEF-EF scores were nominally higher in subjects in active treatment with improved grayscale ratings versus those with no improvement on grayscale. Concerning penile blood flow, improvement after LiSWT greater numbers of patients had higher PSV or lower EDV relative to baseline; greater numbers of patients had no worsening in blood flow parameters. Decrease in

EDV reached statistical significance in active treatment Arm 2 at Week 32 ($p=0.003$). Adverse events were transient.

Conclusion: Flaccid penile LiSWT appears to be safe and efficacious for treating ED based on statistically significant changes between sham and active treatments in primary outcome measures grayscale ultrasound and DUS.



Keypoints:

This single-blind, sham-controlled, randomized study in men with ED naïve to acoustic wave therapy stopped early due to COVID. Thirty-six subjects were randomized to one of two treatment arms, assigned 2:1 to active or sham. This interim analysis examined changes from baseline in the primary outcome measures of grayscale ultrasound and DUS in both sham and active treatment arms. In general, the proximal penis exhibited greatest improvement (decreased heterogeneity score) on grayscale. The number of subjects with improved erectile tissue grayscale ratings in the proximal region was consistently higher in active treatment versus sham. Decrease in EDV reached statistical significance in active treatment Arm 2 at Week 32 ($p=0.003$). All adverse events were transient. Flaccid penile LiSWT appears to be safe and efficacious for treating ED based on statistically significant changes between sham and active treatments in the primary outcome.