

Radial Shock Wave Therapy in Chronic Pelvic Pain Syndrome (CPPS)

Author: Kernesyuk Miroslav Nikolaevich, Candidate of Medical Science, Urologist

Affiliations: URO-PRO INTERNATIONAL MEDICAL CENTER, Yekaterinburg, Sverdlovskaya oblast, Russian Federation

ABSTRACT

Objective:

To investigate the effectiveness of extracorporeal shock wave therapy (ESWT) in comparison to pharmacological treatment in patients for symptoms alleviation in chronic pelvic pain syndrome (CPPS).

Patients and Methods:

Thirty patients suffering from CPPS for at least 3 months were investigated in two groups. Both groups were treated once per week for a 6 months period. Group 2 was established as control group. The investigation was designed as controlled, randomized study.

ESWT was administered using a perineal approach with standard radial ESWT device. In the first group, patients were treated by ESWT once a week for 4 weeks by a defined protocol. The second group received the pharmacological treatment. Standardised follow-up was performed 1, 2, 4 and 12 wk after the treatment.

Results:

All patients completed outpatient treatments and follow-ups. All 15 patients in the first group showed significant improvement of pain, quality of life in comparison to the control group, which experienced less significant improvements. Perineal ESWT was easy and safe to perform and was without any side-effects.

Conclusions:

The study revealed perineal ESWT as a safe and effective therapy option for CPPS with more significant effects in comparison to pharmacological treatment. ESWT is interesting because of its easy and inexpensive application, the lack of any side-effects.

Keywords:

Shock wave therapy, chronic pelvic pain syndrome, chronic abacterial prostatitis

1. Introduction

Prostatitis is one of the most frequent outpatient urological diagnoses. Most men have the abacterial form of chronic prostatitis, or chronic pelvic pain syndrome (CPPS) [1, 2]. The incidence is increasing, being reported to be around 15% [3, 4]. The National Institutes of Health (NIH) [5] distinguishes the various bacterially induced forms from the non-inflammatory CPPS. CPPS type IIIB (non-inflammatory) is characterized by the lack of signs of infection in urine and sperm as well as by the specific symptoms. Symptoms of CPPS are urinary and erectile dysfunction, pain focused in the prostate region etc. The pathophysiology of CPPS has not yet been completely explained. Previous infections, pelvic floor hypertension, local chemical alterations, and perfusion disturbances are under discussion. [6]

Medical therapies such as analgesics, anti-inflammatory agents, antibiotics, α -receptor blockers and 5α -reductase inhibitors are used alone and in various combinations [7, 8, 9], with variable success rates. Therefore, non-drug treatment options have become increasingly important.

Low-energy shock waves (ESWT) are successfully used for treating orthopaedic pain syndromes, fracture and wound healing disorders. ESWT of ischaemia induced myocardial dysfunction has achieved a significant increase in perfusion in the regions with reduced blood flow [10]. Effectiveness of perineal extracorporeal shockwave therapy has been investigated in CPPS patients [4, 11, 12].

In this study we conducted a randomized study to compare the efficacy of ESWT on CPPS and pharmacological treatment of CPPS.

2. Patients and methods

From January 2012 to August 2012, the patients with type IIIB prostatitis / chronic pelvic pain syndrome of at least 3 months duration and no evidence of bacterial in urinary and seminal culture tests (criteria according NIH classification) were eligible for the study.

The study inclusion criteria were as follows: non-addiction to drugs and narcotics, chronic pelvic pain existence for more than 3 months, and certain diagnosis of chronic nonbacterial/chronic pelvic pain syndrome defined as pain in the bladder, groin, genitalia or lower abdomen.

To rule out other pathologies had been performed numerous examinations: digital rectal examination, transrectal prostate ultrasound, prostate-specific antigen (PSA) testing, prostate microscopy, prostate seed secretion, prostatic secretions PCR on Chlamydia, ureaplasmosis, gonorrhea, trichomoniasis, herpes.

After patient consultation about the method, they were allocated into either ESWT treatment group (main group) or pharmacological treatment group (control group) with simple randomization.

The main group received ESWT weekly in a four-week period, the frequency of 10Hz, the intensity of wave 3-5 bar (depending on tolerance). Impact points were perpendicular to the skin – on the median suture of the perineum, 2-3cm anterior to the anus, more lateral to the midline point, to the right and to the left on 2-3cm. The total number of 3000 pulses was delivered, 1000 pulses on each

impact point. The device used for the study was a standard pneumatic radial shockwave unit (BTL-5000 SWT Power, BTL Industries Limited, UK).

The control group received the chronic administration of 1- α blockers, non-steroidal anti-inflammatory agent periodically.

The follow-up schema included clinical examinations and complaints at 1, 2, 4 and 12 weeks following ESWT. CPPS-related complaints were investigated using the NIH-developed Chronic Prostatitis Symptom Index (NIH-CPSI). Finally, obtained data were recorded in special profile for each patient and analysed.

3. Results

The average age in the main group was 39 yr (range: 34-44) and in the control group 38 yr (range: 31-44). NIH-CPSI scores at all four follow-up time points in the main group decreased more significantly as compared to the control group. At week 12 in the main group the values were significantly lower than in the baseline.

The results in Table 1 showed that improvements in total NIH-CPSI scores during study period in the main group were significantly better than those in control group. There were no apparent side-effects and all patients completed the treatment course and the follow-up.

NIH-CPSI index reduction by an average of 62.4% was observed in the main group. In case of control group the NIH-CPSI index declined by an average of 42.5%.

Table 1: Changes dynamic NIH-CPSI results studied on patient groups during the therapy.

№ of clinical record (with using SWT)	Age	NIH-CPSI Prior to treatment	NIH-CPSI After treatment	№ of clinical record (without SWT use)	Age	NIH-CPSI Prior to treatment	NIH-CPSI After treatment
y1271	37	37	11	y2691	31	38	38
y7148	41	36	2	y6950	38	41	33
y7195	34	32	34	y7269	40	36	7
y7269	35	41	22	y7347	35	33	6
y7448	40	40	20	y7385	37	32	5
y7376	43	38	3	y7398	36	31	11
y7496	38	37	7	y7508	43	40	32
y7508	33	33	10	y7581	44	37	35
y7667	44	38	15	y7610	36	36	26
y7789	36	40	12	y7679	32	35	24
y7855	35	41	16	y7768	35	35	18
y7877	41	35	12	y7789	36	33	16
y7937	43	36	15	y7816	41	40	23
y7997	40	34	14	y7876	42	33	21
y8200	39	33	16	y8010	36	39	14
Total result NIH-CPSI		551	207			539	309
Average	39	36.7	13.8		38	35.9	20.6

4. Discussion

Because of the lack of efficacy of the majority of drug-based therapies, new options for CPPS treatment are of broad interest.

Generally, the effects of extracorporeal shock waves on living tissue consists of transformation of mechanical signals into biochemical or molecular-biologic signals that again induce particular alterations within cells. Many possible ESWT effects are currently under discussion: hyperstimulation of nociceptors and interrupting the flow of nerve impulses could lead to pain alleviation. ESWT is able to increase local microvascularisation as well as reduce muscle tone and spasticity. [12]

Our study showed that total NIH-CPSI and quality of life improved more significantly in ESPWT group compared to the control group.

A few studies have evaluated the efficacy of ESWT on CPPS. Zimmermann et al in their first study [11] showed statistically significant improvements in pain and quality of life after ESWT. In his findings is shown that ESWT is not traumatic for the prostate gland. In our patients no pain or discomfort was observed during or after treatment. Zimmermann et al. reported a similar trial [12] that included 60 patients in which they used National Institutes of Health Chronic Prostatitis Symptom Index (NIH-CPSI), International Prostate Symptom Score (IPSS), International Index of Erectile Function (IIEF) and the Visual Analog Scale (VAS) to investigate their parameters. They found reduced pain and improved QOL in a significantly greater proportion of patients who underwent ESWT treatment.

In our study, an improvement in symptoms was observed in both treatment groups.

The pathogenesis of the CPPS is not completely understood. Extracorporeal shock waves affect the tissue by transformation of mechanical signals into biochemical or molecular biologic signals [12]

For the present study, the follow-up duration has so far been restricted to 12wk. We are continuing to evaluate the patient till 6 months after the end of ESWT treatment to obtain long-term results.

As proven in many investigations, the total applied ESWT energy significantly influences the final outcome. Therefore, ESWT effect can be considered dose dependent [13]. Our treatment schedule is partly empirical but similar to various nonurologic schemata, with proven efficiency and a very low or absent side-effect rate [14, 15].

5. Conclusions

In conclusion, our findings confirmed ESWT to be safe and effective therapy for CPPS in the short term. ESWT could be of significant importance in the treatment of CPPS (type IIIB prostatitis) because of the straightforwardness of its application and the lack of any appreciable side-effects. An additional advantage lies with the local application to the affected region compared with the systemic load caused by drugs (analgesics), which typically leads to not-inconsiderable side-effects, especially when administered over longer periods of time.

The study demonstrated that ESWT of the prostate region can be a safe and effective treatment with remarkable release of symptoms. In particular due to pain reduction, the quality of life could be improved markedly, which is the most important issued for the majority of CPPS patients.

REFERENCES

- 1 Nickel JC. Classification and diagnosis of prostatitis: a gold standard? *Andrologia* 2003; 35 : 160-7
- 2 Krieger JN, Egan KJ, Ross SO, Jacobs R, Berger RE. Chronic pelvic pain represents the most prominent urogenital symptoms of chronic prostatitis. *Urology* 1996; 48: 715-21
- 3 Shoskes DA, Berger R, Elmi A, Landis JR, Propert KJ, Zeitlin S. Muscle tenderness in men with chronic prostatid / chronic pelvic pain syndrome: the chronic prostatid cohort study. *Journal of Urology* 2008; 179: 556-560.
- 4 Marszalek M, Berger I, Madersbacher S. Low-energy extracorporeal shock wave therapy for chronic pelvic pain syndrome: finally, the magic bullet? *European Urology*. 2009; 56: 425-426.
- 5 Krieger JN, Nyber LJ, Nickel JC. NIH consensus definition and classification of prostatitis. *JAMA* 1999; 282 : 236-7
- 6 Pontari MA. Chronic prostatitis/chronic pelvic pain szndrome. *Urol Clin North Am* 2008;35: 81-9
- 7 Porpert KJ, Alexander RB, Nickel CJ et al. The Chronic Prostatitis Collaborative Research Network. Design of a multicenter randomized clinical trial for chronic prostatitis/chronic pelvic pain syndrome. *Urology* 2002; 59: 870-6
- 8 Nickel JC, Downey J, Ardern D, Clarke J, Nickel K. Failure of monotherapy strategy for difficult chronic prostatitis / chronic pelvic pain syndrome. *J Urol* 2004; 174 : 551-4
- 9 Anothaisintawee T, Attia J, Nickel JC et al. Management of chronic prostatitis / chronic pelvic pain syndrome: a systematic review and network meta-analysis. *Journal of the American Medical Association*. 2011; 305: 78-86.
- 10 Fukumoto Z, Ito A, Uwatoku T et al. Extracorporeal cardiac shock wave therapy ameliorates myocardial ischemia in patients with severe coronary artery disease. *Coron Artery Dis* 2006; 17 . 63 – 70
- 11 Zimmermann R, Cumpas A, Hoeltl L, Janetschek G, Stenzl A, Miclea F. Extracorporeal shock-wave therapy for treating chronic pelvic pain syndrome: a feasibility study and the first clinical results. *British Journal of Urology International* 2008; 102: 976-980
- 12 Zimmermann R, Cumpas A, Miclea F, Janetschek G. Extracorporeal shock wave therapy for the treatment of chronic pelvic pain syndrome in males: a randomized, double-blind, placebo-controlled study. *European Urology* 2009; 56: 418-424
- 13 Malaz DS, Pressman MM, Assili A, et al. Extracorporeal shockwave therapy versus placebo for the treatment of chronic proximal plantar fasciitis: results of a randomized, placebo-controlled, double-blinded, nulticenter interventional trial. *J Foor Ankle Surg*. 2006; 45: 196-210.
- 14 Rompe JD, Meuer A, Nafe B, Hofmann A, Gerdesmeyer L. Repetitive low-energy shock wave application without local anesthesia is more efficient than repetitive low-energy shock wave application with local anesthesia in the treatment of chronic plantar fasciitis. *J Orthod Res* 2005; 23:931-41.
- 15 Gollwitzer H, Diehl P, von Korff A, Rahlfs VW, Gerdesmeyer L. Extracorporeal shock wave therapy for chronic painful heel syndrome: a prospective, double blind, randomized trial assessing the efficacy of a new electromagnetic shock wave device. *J Foot Ankle Surg*. 2007; 46:348-57.
- 16 Vahdatpour B, Alizadeh F, Moayednia A, Emadi M, Khorami MH, Haghani S. Efficacy of Extracorporeal Shock Wave Therapy for the Treatment of Chronic Pelvic Pain Syndrome: A Randomized, Controlled Trial. *Urology* 2013, 6 pages.