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Prospective Study on the Effectiveness of Transurethral Microwave Therapy in the Management of Chronic Prostatitis/Chronic Pelvic Pain Syndrome

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ABSTRACT

Background: Pain and urinary symptoms affecting the prostate and/or other areas of the male reproductive system are symptoms of chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS).

Objective: The safety and acceptability of cooled transurethral microwave thermotherapy (TUMT) for chronic prostatitis/chronic pelvic pain syndrome were examined in this prospective feasibility research.

Methods: There were 76 male patients were presented in this study.Patients who had an NIH-CPSI pain score of 8 or higher and had symptoms that persisted for more than three months prior to treatment were randomly assigned to either cooled TUMT at around 55°C or cooled TUMT at about 70°C intraprostatic temperatures. Outcomes were assessed.

Results: The mean age of the patients was 29.6±4.17 years with mean weight 71.5±7.28 kg. Mean duration of symptoms was 23.10±8.73 months. After 12 months, the mean NIH-CPSI score showed significant improvements in total score (22.3± 5. vs. 10.3±9.1), pain score (12.3±3.4 vs. 3.7±6.5), quality-of-life impact score (6.9± 2.9 vs.2.7 ± 3.5; all P <0.0002), and urinary score (5.4±1.7 vs.2.0 ± 1.1; P = 0.0077).

Conclusion: For chronic prostatitis that has proven difficult to treat, cooled TUMT provided better outcomes. To better assess the effect on fertility and long-term durability, lengthier follow-up and a bigger experiment are necessary

Keywords: Prostatitis, NIH-CPSI Pain score, Transurethral microwave thermotherapy..

1. INTRODUCTION:

Chronic prostatitis or chronic pelvic pain syndrome (CP/CPPS) can be diagnosed if you have had painful ejaculation or urinary symptoms without a confirmed infection of the urinary tract, or if you have had discomfort in the perineum, rectum, prostate, penis, testicles, or abdomen for at least three out of the last six months. Among urological diagnoses, CP/CPPS ranks first in men over the age of 50 and third in men under the age of 50 [1]. The prevalence of prostatitis in Korea is from 15% to 25% of all urologic clinic visits [2]. Cases of CP/CPPS can be categorized as either IIIA or IIIB depending on whether inflammatory components are found in expressed prostatic secretions (EPSs) or semen. Regrettably, very little is known about prostate cancer, and even less is disclosed. Presently, there is a lot of buzz around CP/CPPS pathophysiology and the optimal treatment options. However, we still don't know what the optimal therapy is. Consequently, it stands to reason that a multimodal approach would provide better results. A number of treatments, including pharmaceutical and non-pharmaceutical options, have been proposed and put into action [3-5]. Numerous different interventional therapies have been employed, each with its own set of advantages and disadvantages; they include neuromodulation, extracorporeal shockwave therapy, botulinum toxin injection, transurethral needle ablation of the prostate, and microwave thermotherapy. Originally, it was called transrectal microwave hyperthermia of the prostate and it was used to treat prostate cancer [4]. Benign prostatic

hyperplasia and CP were later added to its scope of usage. When traditional treatments for CP fail, transrectal prostatic heat may be an option for certain individuals [5,6].

To alleviate persistent prostatitis, doctors might prescribe either transurethral microwave thermotherapy (TUMT) or transrectal microwave therapy (TRMT). Weighing the pros and cons of each of these methods is essential. Patients may have discomfort, UTIs, and urethral damage as a result of the invasive approach, despite TUMT's improved effectiveness [7,8].Because TRMT is easier to take than TUMT, patients often report fewer bouts of lower urinary tract infections after receiving the treatment.[9]

Based on our previous research, the relative efficacy for CP/CPPS patients treated with medication alone was 54.5%, for TRMT alone it was 69.8%, and for a combination of the two it was 80.8%.From ten until twelve After treatment, patients' NIH-CPSI scores were significantly lower than before therapy ($P < 0.01$).[10-12] Based on the data shown above, TRMT appears to be a viable treatment option for CP/CPPS.This study evaluated the efficacy of transrectal microwave thermotherapy (TRMT).

2. MATERIALS AND METHODS

This prospective study was carried out on 76 CP/CPPS patients, who were recruited among men visiting the urology department at DHQ Hospital Daggar Buner KPK from March 2023 to November 2024.

Written informed permission was obtained from all individuals. All patients exhibited symptoms for at least three months and met the diagnostic criteria for CP/CPPS set out by the National Institutes of Health (NIH). Each patient had their NIH Chronic Prostatitis Symptom Index (NIH-CPSI) score calculated by a questionnaire. Any previous urological surgery, neurological disease, neurogenic bladder, perianal or rectal issues, varicocele, urethritis, or epididymitis would exclude a patient from participation. The blood PSA level was tested to rule out prostate cancer. Participating individuals did not have a history of antibiotic or anti-inflammatory medication use.

The main endpoint was evaluated after 12 months of TRMT treatment in patients. At baseline, as well as at 12 months, the NIH-CPSI scores were documented. EPS, cytokine levels, and semen analysis were utilized for the purpose of evaluating inflammation. We considered a p-value below 0.05 to be statistically significant. We used SPSS 24.0 to analyze all of the data.

3. RESULTS

The mean age of the patients was 29.6±4.17 years with mean weight 71.5±7.28 kg. Mean duration of symptoms was 23.10±8.73 months. Previous history of treatment was found in 13 (17.1%) cases. Mean prostate volume of specific antigen was 0.10±0.7 ng/ml, mean TRUS was 20.1±3.8 ml and mean blood cells was 5987±1467. (table 1).

Table-1: Baseline details of the presented cases

Variables	**No/ Percentage (76)**
Age (years)	29.6±4.17
Mean weight (kg)	71.5±7.28
Mean duration of disease (months)	23.10±8.73
specific antigen (ng/ml)	0.10±0.7
Mean TRUS (ml)	20.1±3.8
mean blood cells ((/µl)	5987±1467
History of treatment	
Yes	13 (17.1%)
No	63 (82.9%)

After 12 months, the mean NIH-CPSI score showed significant improvements in total score (22.3± 5.3 vs. 10.3±9.1), pain score (12.3±3.4 vs. 3.7±6.5), quality-of-life impact score (6.9± 2.9 vs.2.7 ± 3.5; all $P < 0.0002$), and urinary score (5.4±1.7 vs.2.0 ± 1.1; $P = 0.0077$).(table 2)

Table-2: Outcomes of NIH-CPSI baseline and after 12months

NIH-CPSI	**Baseline**	**12 months**
Total	22.3± 5.3	10.3±9.1
Pain score	12.3±3.4	3.7±6.5
Qol	6.9± 2.9	2.7 ± 3.5
Urinary score	5.4±1.7	2.0 ± 1.1

Frequency of reduced sperm motility was found in only 3 (3.9%) cases. Satisfaction rate was 69 (90.8%) among all cases. (table 3).

Table-3: Post treatment satisfaction and complication

Variables	No/ Percentage
Sperm motility	
Reduced	3 (3.9%)
normal	73 (96.1%)
Satisfaction	
Yes	69 (90.8%)
No	7 (9.2%)

4. DISCUSSION

The symptoms of chronic prostatitis (CP) are thought to be complicated and multi-factorial. Although antibiotics are the gold standard, they do not improve therapeutic effectiveness owing to the unique structure and location of the prostate. Neither the pathophysiology nor the treatment guidelines for chronic pelvic pain syndrome (CPPS) are well-defined. Possible treatments include antibiotics, NSAIDs, and phototherapeutics. When tested on CP/CPPS, all approaches yielded disappointing results.in [13] Although TRMT treated with CP/CPPS had positive results in certain trials, the therapy is still controversial and has not achieved widespread acceptance.[14] Nevertheless, transurethral thermotherapy did result in a few side effects, including discomfort, hematuria, and urinary tract infections.[15] The fact that transrectal thermotherapy has shown few adverse effects makes it a potentially useful treatment for CP/CPPS, as stated above. Individuals with a CP/CPPS diagnosis and an NIH-CPS score more than 8 were eligible to participate in TRMT studies. Half of the patients' symptoms were alleviated, but to varied degrees.[16]

According to our study, NIH-CPSI score showed significant improvements in total score (22.3± 5.3 vs. 10.3±9.1), pain score (12.3±3.4 vs. 3.7±6.5), quality-of-life impact score (6.9± 2.9 vs.2.7 ± 3.5; all P <0.0002), and urinary score (5.4±1.7 vs.2.0 ± 1.1; P = 0.0077). Results were comparable to the study conducted in past.[17] Even though TRMT therapy had a short-term impact on sperm, it did not work the same way for patients of different ages and types of CP. Patients with advanced age or those who have been living with CP or CPPS for a long period may have decreased sperm quality due to the age-related decline in sperm quality. According to Menkveldet al.[18], sperm morphological metrics are significantly negatively affected by IIIA CP/CPPS, but IIIB CP/CPPS has no influence on sperm. Based on our research, the effect of TRMT is lower in patients aged 40–60 compared to those aged 20–40. The current findings show that patients with IIIB CP/CPPS benefit more from TRMT treatment in terms of sperm quality compared to patients with IIIA CP/CPPS, when considering the various types of CP/CPPS. This retrospective investigation prevented us from analyzing the reactive oxygen species (ROS) in the semen. Nonetheless, a key component of sperm quality, reactive oxygen species (ROS) in semen and prostatic fluid, can be reduced in patients treated with TRMT, according to our earlier research.[19] In current study, frequency of reduced sperm motility was found in only 3 (3.9%) cases.

Consistent with earlier research and our own findings, TRMT may influence CP/CPPS. A decrease in NIH-CPSI was noted at the conclusion of therapy and follow-up, and the patient reported an improvement in their symptoms following treatment. Therefore, TRMT holds great potential as a future therapy for CP/CPPS. It is not appropriate for all CP/CPPS patients, particularly those who are single or who intend to have a family soon, as stated in the TRMT handbook.[20]

5. CONCLUSION

For chronic prostatitis that has proven difficult to treat, cooled TUMT provided better outcomes. To better assess the effect on fertility and long-term durability, lengthier follow-up and a bigger experiment are necessary.

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