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# EFFECTIVENESS OF PULSED SHORT WAVE DIATHERMY ON COCCYDYNIA

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ABSTRACT

**Introduction:** .Coccydynia is pain around the coccygeal region which may be caused due to sudden impact over the coccyx area from falls or traumatic injuries and due to pressure during child birth in women resulting in pain and inflammatory changes of the surrounding ligaments and muscles. Pulsed Shortwave Diathermy is a therapy which is commonly prescribed for pain associated with muscles and joints. It is a heating modality which is used to promote tissue healing and also to reduce pain.

**Methods:** The procedure was clearly explained to the patients. The informed consent was obtained from the patients. Numerical Pain Rating Scale (NPRS) was used for the functional evaluation of the coccyx region, before and after the treatment.The patients were instructed to simply mark the line to indicate the pain intensity. The patients werepositioned in side lying, by placing onepillow in between the legs with one knee flexed and supported on the pillow.

**Results:** Graph-1 and Table -1 shows there was a significant difference between pre and post test reduction in Numerical Pain Rating Scale(NPRS) score among subjects treated with Pulsed Shortwave Diathermy(pain scores was reduced from 7.33 to 3.80) for a period of four weeks which denotes significant reduction of pain and improvement in quality of life.

**Discussion:** Thus Pulsed Shortwave Diathermy is found to be effective in relieving pain among acute coccydynia patients.On the basis of this study results, application of Pulsed Shortwave treatment is recommended in the populations with coccydynia.

**Conclusions:** Pulsed shortwave diathermy has shown significant result in reduction of pain in subjects with coccydynia.

## INTRODUCTION

The coccyx is also known as tailbone which is located at the final segment of the vertebra column. It is made up of three to four vertebra, among which the three small are loosely fused and attached to the sacrum and are located just above the cleft of the buttocks. It is considered as an important attachment for various muscles, tendons and ligaments. The coccyx usually moves slightly forward or backward while pelvis and leg moves. It is the site of insertion for pelvic floor muscles,which helps in supporting the reproductive organs.[1]The ventral side of the coccyx is slightly concave in nature and dorsal side is slightly convex in nature.

Coccyx is part of the weight bearing tripotstructure which supports the sarcoccygealsymphysis while sitting.The anterior side of the coccyx is for the attachment of group of muscles .

The ligaments that attaches to the coccyx are anterior and posterior sarcoccygeal ligaments, lateral sarcococcygeal ligament, and anterior and posterior longitudinal ligament.[1,2]The coccyx support the position of anus through the anococcygeal raphe, on the posterior side, it is attached to the gluteal maximus which extend the thigh while walking.

Coccydynia is clinical condition which is characterized by pain and tendernesss over coccygeal region.The word 'dynia ' refers pain .The common symptom is pain while sitting and standing up from a chair.[3,4] It is the pain in the terminal portion of the spine. The pain aggravates while weight bearing in sitting position.[4,5] and pain may include midline pain which is located below the sacrum and above anus and the inflammation of the tail bone which is located deep between the buttocks.[1,6]

Coccydynia is the injury of the coccyx which may result from fall.[7]The abnormal mobility of the coccyx is associated with chronic inflammatory process leading to degenerative of structure.[8] The pain over tailbone may be caused by sciatica, infection, cysts, sacrolitis or fracture of coccyx. Sitting often worsens coccyx pain.[9,10]Pain is aggravated during bowel movements and also in case of depression and anxiety for long period.The pain improves usually while standing and walking. Those suffering from depression and anxiety have the coccyx pain felt for a longer duration.[2,11]

Pulsed Shortwave Diathermy is a commonly prescribed physiotherapy management for muscular and joint associated pain. Pulsed shortwave diathermy is a heating modality which is used to promotes healing of tissues and to reduce pain.[12] It uses high frequency electric current to stimulate heat generation within the body tissues. It stimulates the circulation and aids in the reduction of the inflammatory process.[12,13]

Pulsed Shortwave Diathermy can be applied to the body mass tissue in the same way as shortwave diathermy.[14,15]In several machines the method of application of drum type electrode is limited ,which consists of flat helical metal coil contained with plastic casing.[16] The plastic casing will keep the coil away from the skin surface. The skin and superficial tissues are weakened as the field intensity decreases with distance from the coil, when a coil is placed close to the skin surface.[17,18]

The drum type electrode is positioned to the close or just near the area of skin to be treated and coil is well separated from the skin and superficial tissues.[19]The exposure difference between deep and superficial tissue is reduced, and is expected for uniform effects.

To ensure that there is no sensory deficit a thermal sensation test is to be carried out. It is done especially delivering pulsed shortwave at mean power exceeding 5w.[20,21]With the low average power of pulsed short wave there is danger of a burn due to concentration of the field by metal or water. It should be avoided at the wet dressing and on any other metal implants during treatment time. It increases the pulse delivery at higher frequencies and can cause burns.

There is no damage effect or any kind of problem with the Pulsed Shortwave Diathermy. However while the mode of action remains unknown, the use of pulsed shortwave diathermy is usually avoided over rapidly dividing tissue, such as fetus or the uncontrolled growth of precancerous tissue.[19,20]For the effective treatment of soft tissue trauma mostly the pulsed short Wave diathermy is regarded, especially during early acute stages.

Pulsed Shortwave Diathermyis used to relieve the pain in inflammatory diseases and also to provided heat to deep tissues. It is an effective treatment for acute and chronic condition, also for somatic pain caused by ligamentous and muscular elements which is inserted in to the coccyx.

**Yousefmaruan t et al.,(2017)** demonstrated that extracorporeal shockwave diathermy had favourable outcome in coccydynia. The majorityofpatients had partial relief of their pain and disability following this therapy.

**Shin-feng lintel t et al.,(2015)** demonstrated that shortwave therapy is more effective and satisfactory in reducing discomfort and disability caused by coccydynia that the use of physical modalities.

## METHODOLOGY

**STUDY DESIGN :** Experimental
**STUDY TYPE :** Pre and Post-test type
**SAMPLING METOD :** Convenient sampling
**SAMPLE SIZE :** 15
**STUDY SETTING :** Outpatient Department of Physiotherapy, SRM Medical College Hospital and Research Centre, Kattankulathur

## INCLUSION CRITERIA

Both Men & Women aged between 18 to 50 years
Patient diagnosed as coccydynia

## EXCLUSION CRITERIA

Coccyx fracture
Skin infection
Pregnancy
Menstruation

## PROCEDURE

According to the inclusion and exclusion criteria, 15 samples were selected between the age group 18-50. Both male and female subjects diagnosed with coccydynia by a physician or orthopaedic surgeon were included in the study.The procedure was clearly explained to the patients. The informed consent was obtained from the patients. Numerical Pain Rating Scale (NPRS) was used for the functional evaluation of the coccyx region, before and after the treatment.The patients were instructed to simply mark the line to indicate the pain intensity. The patients werepositioned in side lying, by placing onepillow in between the legs with one knee flexed and supported on the pillow. In Pulsed Shortwave Diathermy, Monoplanar technique (disc method) was used. Monoplanar technique consists of placing one electrode over the coccyx region and the other electrode at a distant side.

Pre-test and post-test were conducted on the patients by using Numerical Pain Rating Scale for pain assessment. Over a period of four weeks, a total of 5treatment sessions .

## OUTCOME MEASURE

Numerical Pain Rating Scale ( NPRS)

## DATA ANALYSIS

The IBM statistical package for social science (SPSS) version 22 for Windows was used for data analysis. The statistical tool used in this study was the paired 't' test.Paired 't' test was used for analysis of pre-test and post-test was conducted for selected group.

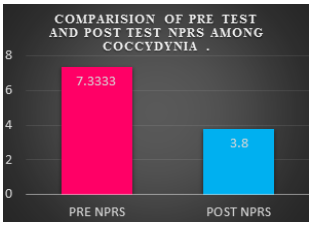
## RESULTS AND DISCUSSION:

**TABLE 1**

Pre-test And Post-test Scores Of Numerical Pain Rating Scale Among Coccydynia Patients Post Management With Pulsed Shortwave Diathermy For A Period Of Five Days

| PSWD | | Mean | N | SD | Paired 't' test | SIG |
|---|---|---|---|---|---|---|
| Numerical Pain Rating Scale | Pre-test | 7.3333 | 15 | 51460 | 34.000 | .000 |
| | Post–test | 3.8000 | 15 | | | |

According to Table 1, the pre-test mean Numerical Pain Rating Scale score is 7.3333and the post-test mean value is 3.8000, which shows significant changes in Numerical pain Rating Scale (NPRS) score with Pulsed Shortwave Diathermy therapy (PSWD) treatment.




**GRAPH I:** PRE-TEST AND POST-TEST SCORES OF NUMERICAL PAIN RATING SCALE AMONG COCCYDYNIA PATIENTS POST MANAGEMENT WITH PULSED SHORTWAVE DIATHERMY FOR A PERIOD OF FIVE DAYS.

## DISCUSSION

This study was done to find the effect of Pulsed Shortwave Diathermy(PSWD) in patients with Coccydynia.

15 patients who were in the age group of 18-50 years, of both genders and who were suffering from coccydynia were selected and treated with Pulsed Shortwave Diathermy for a period of five days.

On comparing the pre-test and post-test values of the present study, it was revealed that there was a statistically significant difference ($p<0.05$) in both the groups in terms of pain intensity as measured by Numerical Pain Rating Scale.

Patient who scored 7.33 on a Numerical Pain Rating Scale before the treatment found a great relief of pain post the management with Pulsed Shortwave Diathermy for a period of five days post which they gave a score of only 3.80 which shows that there was a drastic reduction of pain.

This result goes in hand with **Hung pin,et al,(2015)** who stated that non-invasive treatment options with Extracorporeal Shockwave Therapy and physical modalities like Shortwave Therapy were effective in reducing pain in coccydynia.

**Fukuda TY,et al,(2008)** stated that the Pulsed Shortwave Diathermy is an effective method for pain relief and improvement of function and quality of life in short term among patients with musculoskeletal condition.

**K Dziedzic,et al,(2005)** stated that there is no additional benefit by adding either manual therapy or Pulsed Shortwave Diathermy to a package of advice and exercises asdelivered by musculoskeletal physical therapist.

The above results can be explained by the fact that Pulsed Shortwave Diathermy is a commonly prescribed treatment for muscular and joint associated pain. Pulsed Shortwave Diathermy is a heating modality which is used to promote healing of tissues and to reduce pain[12]. It uses high frequency electric current to stimulate heat generation within the body tissues. It stimulates the circulation and aids in the reduction of the inflammatory process.[12,13]

The effect of Pulsed Shortwave Diathermy can be basically divided into two types those of the electric field and those of the magnetic field.[14] A cell involved in the inflammatory process demonstrates a reduced cell membrane potential and consequently the cell function is reduced.[7,15]

The principles production of continuous output of oscillation high frequency is 27.12MHz. The out-put can be turned on and off by incorporating timing circuit which allows the burst of current that is to be emitted for any length of time fixed length pulses can also be given by some machines.[14,1] The synthesis of nitric oxide is associated with an increased blood flow.[11]

Thus Pulsed Shortwave Diathermy is found to be effective in relieving pain among acute coccydynia patients.On the basis of this study results, application of Pulsed Shortwave treatment is recommended in the populations with coccydynia.

## CONCLUSION

This study concludes that Pulsed Shortwave Diathermy in effective in managing patients with acute coccydynia. This study shows a better pain relief and increase in comfort after the treatment with Pulsed Shortwave Diathermy. Thus we recommend the use of Pulsed Short wave Diathermy in patients with coccydyniato reduce pain and improve the quality of life.

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