

Effectiveness of Coccygeal Manipulation in Coccydynia: A randomized control trial

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Abstract

Purpose

The purpose of this study was to find out the effectiveness of coccygeal manipulation in the management of coccydynia.

Design

Randomized control trial where the subjects were randomly allocated to control & experimental groups.

Setting

Physiotherapy outpatient department of KLES Hospital, Belgaum, Karnataka state, India - 590010.

Participants

Subjects with idiopathic coccydynia.

Interventions

Phonophoresis, TENS & coccygeal manipulation.

Main Outcome Measures

Intensity of pain on visual analogue scale & pain free sitting time.

Methods

Control group subjects were treated with phonophoresis, use of coccygeal pillow and TENS only. Experimental group subjects were treated with coccygeal manipulation in addition to above protocol of the treatment.

Results

Subjects treated with coccygeal manipulation had statistically and clinically better out come in terms of pain relief and pain free sitting time at the end of tenth treatment session.

Conclusions

Idiopathic coccydynia is somewhat common in obese individuals as it determines the way a subject sits. Coccygeal manipulation could be of help and can be used as an addition to the conventional physiotherapy treatment.

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Key Words

Coccydynia, manipulation, physiotherapy.

Introduction

The sacrococcygeal junction remains movable throughout life but, rarely, may fuse. Because of its muscular attachments, the coccyx is in constant motion, particularly in the act of defecation. Pressure is exerted against the posterior aspect of the bone in sitting, the coccyx acting as a shock absorber and moving forward. Pain about the coccyx results from local conditions or is referred from other regions. Coccydynia or coccygeal pain is a well-known but rarely studied painful syndrome affecting the coccyx region.¹

Coccydynia is one of the painful conditions that limits sitting. Patients with traumatic injuries of the coccyx present with clear-cut picture such as acute pain and tenderness localized to the coccyx. At other times the symptoms are so obscure that the patients are considered neurasthenics. In addition to the pain while sitting on hard surfaces, individuals who suffer from coccydynia may complain of pain on passing hard stool and on sit to stand transfers, possibly because of gluteal muscles contraction or sacroiliac dysfunction.² Coccydynia may occur due to various causes such as fall on the bottom of seat, a kick, obstetric trauma, passage of hard stool, hyper mobility of the sacroiliac joint, idiopathic^{3,4}, coccygeal fracture, coccygeal subluxation & dislocation⁵, obesity⁶, sacral haemangioma⁷, anatomical variation^{8,9} and avascular necrosis of the coccyx¹⁰.

Most of these causative factors may strain or tear the sacrococcygeal ligaments and the condition becomes chronic because the acts of sitting and defecation continually strain the already injured ligaments. A constant annoying discomfort is experienced and accentuated when sitting on a hard surface or during defecation. Occasionally, bending forward is painful. The sacrococcygeal joint is tender, and movement of the coccyx on rectal examination reproduces the pain^{11,12}.

Healthcare practitioners and patients themselves have tried different clinical & non-clinical interventions so as to alleviate the symptoms of coccydynia with variable outcomes. These interventions include NSAIDs, topical application of analgesic ointment, local anesthetic injection, local steroid injection¹³, manipulations^{14,15}, coccygectomy^{16,17}, Cryoanalgesia¹⁸, stiz bath¹⁹, coccygeal pillow, coccyx cushions (donut, doughnut, ring, roof rack) inflatable ring, bottom up sits, chairs (director's chair, reclining chairs, kneeling chairs, chairs with coccyx cut outs, collapsible wheelchairs, use of two chairs without arms), stools (folding, tripod), sitting modifications (reclining, side sitting), advice on how to politely deny sitting and work more in standing and physiotherapy.

However, the conservative treatment approaches like physiotherapy is well accepted. Physiotherapy treatment interventions like Diathermy with rectal electrode²⁰, Levator anus massage¹⁵, joint mobilization¹⁵, or mild levator stretch¹⁵, ultrasound therapy, phonophoresis^{20,21} and TENS have been used with variable outcomes.

Although physiotherapists in India witness and treat coccydynia victims, there is very little information available about incidence, prevalence & methods of treatment used and their efficacy. The present trend suggests that many of the

physiotherapists use local application of ultrasound, phonophoresis, TENS & advice to avoid prolonged sitting and use of coccygeal pillow. However, the use of manual therapy techniques such as levator anus massage, coccygeal manipulation & mild levator stretch etc are not commonly practiced due to varieties of reasons such as unawareness by various clinicians who refer these patients, lack of practical skill on Physiotherapists part & the reluctance by these patients to undergo these manual therapy techniques. Hence it was planned to study the effectiveness of coccygeal manipulation as one of the manual therapy technique in the physiotherapy management of coccydynia.

Method

Subjects

Thirty-six male & female subjects aged 20 to 55 years (mean age 31.06 ± 8.87) who had clinical diagnosis of idiopathic coccydynia without any radiological change and referred to physiotherapy outpatient department at KLE Hospital & Medical Research Center, Belgaum, India 590010 during 21.04.2001 to 28.2.2007 participated in this study. The duration of symptoms was in the range of 15 days to 2 years with an average of 57 ± 6 days. These subjects were selected in a consecutive manner. However they were randomly allocated to either control or experimental group. The inclusion criteria used was subjects with idiopathic coccyx pain and who were willing to undergo coccygeal manipulation if required. Subjects were excluded if they were unwilling to undergo coccygeal manipulations, had local anesthetic injection in past three months and coccygeal fracture.

Procedure

All the subjects were assessed prior to the intervention and if they satisfied the inclusion criteria then their pain intensity score in Visual Analogue Scale was noted and their sitting time without pain was noted. Subjects were randomly assigned to control group or experimental group. Control group subjects were treated with phonophoresis and TENS. For phonophoresis purpose, pulsed therapeutic ultrasound with 1MHz frequency and output of 0.5 W/cm^2 for 3 minutes in acute cases or 1 W/cm^2 for 8minutes in chronic cases along with Pirox gel as a coupling medium. For TENS, High Frequency TENS (Normal mode) was given for 20 minutes in acute cases and Low Frequency TENS (Normal mode) was given for 30minutes in chronic cases. The treatment was continued for ten successive days with an exception of one weekly holiday. Experimental group subjects were treated with coccygeal manipulation²² in addition to above protocol of the treatment with phonophoresis and TENS. For coccygeal manipulation a member of the subject's sex accompanied the investigator. During manipulation subject were instructed to relax and take few deep breaths then the gloved and lubricated index finger of the right hand of investigator was inserted into the anal passage so that it comes to rest against the anterior surface of the coccyx. The thumb of the other hand of the investigator, also gloved but not lubricated was placed on the dorsum of the coccyx to get a good grasp between the two fingers. The actual technique consisted of distraction of the coccyx along its long axis for initial few treatments and then subsequently an attempt was done to correct the alignment by controlled force in coronal plane. Both the group participants were advised to use the coccygeal pillow as early as possible and continue it for 3 months in future. All the participants who participated in the study were advised to take Dolonex-DT 20mg (dispersible tablet) once a day at night which was an oral analgesic for ten days and the topical application of Pirox gel whenever they felt that their pain was severe during the ten

days of treatment. Patients were also strictly advised not to take any sort of heat therapy till the completion of the study.

Results

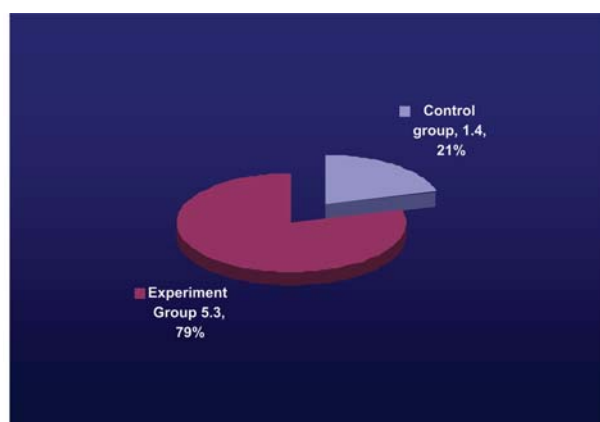
The results of study were assessed in terms of the pain relief on VAS scale and pain free sitting time in minutes. For statistical analysis Graph pad InStat 3 demo software was used. The study results revealed average reduction of pain by 1.4 ± 1.126 in control and 5.3 ± 1.768 in experimental group and the average pain free sitting time in control group was 23 ± 13.351 minutes while as it was 47 ± 7.981 in experimental groups. BMI in male subjects 31.8 ± 2.7 and in female subjects it was 33.4 ± 3.5 .

Table 1: Analyses for differences between the groups for outcome measures

Statistic	Pain relief (VAS score)		Pain free sitting time (mins)	
	Control	Experimental	Control	Experimental
Mean	1.4	5.3	23	47
SD	1.126	1.768	11.351	7.981
N	18	18	18	18
SEM	0.3981	0.6251	4.013	2.822
Unpaired t test value (df, 14)	5.263		4.892	
p value	0.0001*		0.0002*	

* = Statistically significant

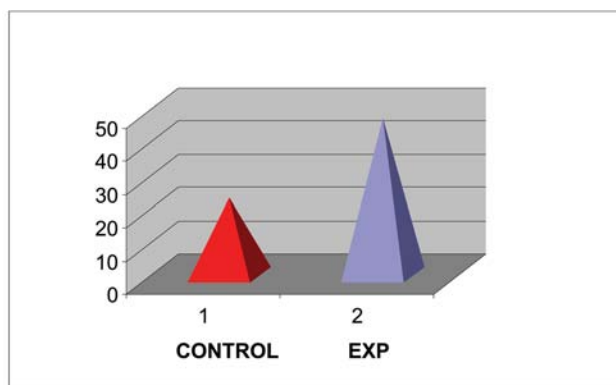
Graph 1: VAS score difference between Control and Experimental groups



Discussion

The results of this study show highly significant difference between experimental and control group. The experimental group subjects that were treated with coccygeal manipulation had better outcome in terms of pain relief on VAS score and increased pain free sitting time. This could be because of the mechanical or neurophysiological effects of coccygeal manipulation that could modulate the pain through the stimulation of articular receptors type I & II. Alternatively it could be because of correction of mal alignment of coccygeal vertebrae that could have been the cause of mechanical pain²² and also due to the

Graph 2: Pain Free Sitting Time in minutes



possibility of placebo effect. However, it was not possible to study the cause and the effect relationship. It was also noted that the BMI was slightly higher in all the subjects. These findings are in accordance with Maigne JY, Doursounian L, Chatellier G (2000)⁶ who studied the role of body mass index and found that body mass index which represents the obesity as one of the risk factor in coccydynia as it (BMI) determines the way a subject sits down. However these findings are not in accordance with Wray CC, Easom S, Hoskinson J (1991)¹⁰ who reported that Physiotherapy was of little help but found that manipulation and injection was more successful and cured about 85% of their subjects. But the details about their subjects are unknown and their intervention was combined with local anesthtic injection.

This study had few limitations like smaller sample size and there was no 100% follow up of these subjects after the study. However, it is recommended that similar study can be done with larger sample size with an added follow up for at least considerable period of time.

Conclusion

Idiopathic coccydynia is somewhat common in obese individuals as it determines the way a subject sits. Coccygeal manipulation could be of help and can be used as an addition to the conventional physiotherapy treatment.

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