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PREVALENCE OF COCCYDYNIA IN LONG TERM BIKE RIDERS

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Abstract

Background: Coccydynia is a painful disorder characterized coccygeal pain which is typically exaggerated by pressure. Coccydynia is well known disorder but rarely studied disorders which affect the coccyx region. The articulation of sacrum and coccyx forms sacrococcygeal junction, the junction remains movable throughout life but rarely they may fuse. Because of its muscular attachments, the motion of coccyx is constant in the act of defecation. Patients with coccydynia feels uncomfortable while sitting or getting up from the ground. The bike riders are prolonged sit due to his occupation. These disorders occur due to continuous sitting. The individuals with coccydynia may complain of pain while passing hard stool and sit to stand transfers, because of gluteal muscle contractions or sacroiliac dysfunctions.

Objectives: To assess the prevalence of coccydynia in long term bike riders due to prolonged sitting. To find out the effect of prolonged sitting on long term bike riders.

Methods: A prevalence study was conducted among bike riders. Bike riders were selected by simple random sampling method. They were asked to fill up a Oswestry low back pain disability questionnaire, and the results were assessed briefly. The visual analogue scale was recorded.

Results: Data from 100 bike riders was obtained and analyzed. The symptoms of Coccydynia were found to be present in 9% of the total bike riders.

Conclusion: These findings reported in the study provide a better understanding of impact and extent of coccydynia. We found out that there is 9% of prevalence of long term bike riders was having Coccydynia which was moderate pain.

Keywords: Coccydynia, Bike riders, Sciatica, Low back pain, VAS, ODI.

INTRODUCTION

The articulation of sacrum and coccyx forms sacrococcygeal junction, the junction remains movable throughout life but rarely they may fuse. Because of its muscular attachments, the motion of coccyx is constant in the act of defecation.¹ Coccydynia is well known disorder but rarely studied disorders which affect the coccyx region.²

Pressure exerted against posterior aspect of bone in sitting, it act as a shock absorber and moving forward. Coccydynia comes under one of the most painful conditions which limits sitting¹

Strained and torn because of most of the causative factors which becomes chronic because of the acts of sitting and defecation which continually strains the already injured ligaments. Therefore pain occurs while bending forward. Also during rectal examination pain is reproduced during the movement of the coccyx due to the tenderness present in the sacrococcygeal joint.³⁻⁴ The individuals with coccydynia may complain of pain while passing hard stool and sit to stand transfers, because of gluteal muscle contractions or sacroiliac dysfunctions.⁵

Coccydynia has various causes.

Causes of coccydynia:

Fall on the bottom of seat

Kick

Obstetric trauma

Hard stool

Idiopathic Subluxation and Dislocation

Obesity¹

Normal range of motion of coccydynia should be approximately 13⁰.⁶ There are other nonorganic causes which cause Coccydynia such as Somatization disorder and psychological disorders.⁷ Commonly, the etiology of coccydynia is external and internal trauma, broken coccyx, a dislocated coccyx, backwards fall, leading to a bruised results to an external trauma.⁸ The incidence of coccygeal angle has been described before, under the name of base angle. It is defined as the angle of coccyx strikes the seat when the person is sitting down. The coccygeal angle of incidence determines the direction sagittal movement of coccyx. The coccygeal angle of incidence is low, coccyx will be more or less parallel with sitting surface at moment of contact. While sitting down on the seat there will be flexion of the coccyx due to the pressure exerted by the seat. At the moment of contact the angle of incidence is large and coccyx is more or less oblique or perpendicular to the seat on the surface.

Therefore, the coccyx goes into extension which increases the intra pelvic pressure and pushes the coccyx backwards and hence extension takes place which is also related to the pressure exerted by the seat.⁹

Anatomy of Coccyx

The name Coccyx is derived from the ancient Greek term which explain the similarity of coccyx or terminal portion of spine to the beak of a cuckoo.The coccyx is a triangular shaped bone which consist of three to five segments :the first vertebral segment of the coccyx which is the largest segment of the coccyx articulates with the sacrum.The last three segments go on decreasing in size fuse to form a single piece of bone.

The anterior surface has three transverse grooves indicating the lines of fusion of last three segments.Anterior sacrococcygeal ligaments and fibres of the levator ani muscle are attached to anterior surface of the coccyx.

The lateral border of coccyx provides attachment to the sacrosiatic ligaments and attachment for the coccygeus muscle anterior to the ligaments and posteriorly to ligaments,attachments fibers of gluteus maximus. The iliococcygeus muscle tendon attached to the tip of the coccyx,support the coccyx and protecting the rectum.This region disc spaces are extremely variable.⁷ Two muscles iliococcygeus and pubococcygeus are combined together to form levator ani muscle.Its helps to form the floor of the pelvis and separate the pelvic cavity from the perineum which is attached to the coccyx.Coccygeus muscle attaches to the coccyx and lower part of the sacrum and arises from spine of the ischium.¹⁰

Function of coccydynia

Coccyx has several important functions.It is insertion site for various muscle,ligaments and tendons and acts as a leg of tripod with ischial tuberosities provides weight bearing support to an individual when in sitting position.Lateral edges moving anteriorly and posteriorly serves as insertion site for coccygeal muscle,sacrotuberous ligament,sacrospinous ligament and fibres of the gluteus maximus muscle.Tip of the coccyx is the insertion for iliococcygeus muscle tendon.

Inferiorly which supports the pelvic floor muscle and contribute voluntary bowel control.In seated position,leaning back results in increase pressure on coccyx.Positional support to anus is provided by coccyx.¹¹

Physiotherapy treatment useful to treat coccydynia patients.

Physiotherapy Treatment:-

Diathermy with rectal electrode

Joint mobilization

Ultrasound Therapy

Phonophoresis

TENS

Ergonomic Advice the patients to avoid prolonged sitting. Advice to use coccygeal pillow, coccyx cushions, sitting modifications accordingly, advice how to sit politely and work more in standing and Get physiotherapy treatment.¹

Material and methodology:

Type of study: Observational Study, Study design-Survey, Place of study-Karad, Sample size-100, Sampling method-Simple random sampling, Duration of study-3 months, Study population: Medical representatives, Delivery boys, Long term bike rider occupation.

Materials: Pillow, Data collection sheet, Pen, Plinth.

Inclusion criteria: All subjects should be long term bike riders, Male subjects are taken for the study, Age group is 20 to 35 years, Subjects should own a bike (Not Fancy Bikes), Daily 4-5 hours bike riding, 5-10 years experience.

Exclusion criteria: Patients with lumbar spine pathologies, Subjects with history of previous low back pain, Subjects previously diagnosed with sciatica, Subjects with Previous history of sacroiliac joint dysfunction, Sports bike owner or rider.

Outcome measure:

To investigate the prevalence of Coccydynia in long term bike riders, the following outcome measures will be used:

1. **Visual analogues scale¹²**
2. **Oswestry low back pain disability questionnaire¹³**

Methodology

After getting ethical clearance from institutional ethical committee informed consent were obtained from 100 male subjects aged between 20-35 years. They were selected for the study according to inclusion and exclusion criteria. The motive and procedure of the study was thoroughly explained to the subjects.

Each subject was assessed separately in assessment room to maintain the dignity of the patient. Oswestry low back pain disability questionnaire was given to each subject. The

tenderness and pain on the coccyx measured on the basis of VAS Scale.

The data from both the outcome measures was collected. After examining all the subjects the statistical analysis were done.

Result and Statistical Analysis:

1) Age Distribution

| Age | 20-25 years | 26-30 Years | 31-35 Years |
|----------|-------------|-------------|-------------|
| Subjects | 21 | 35 | 44 |

Table no.1 Age Distribution Table

Interpretation:

Out of the total 100 subjects 21 subjects were from 20 to 25 years category, 35 were from 26 to 30 years category and 44 subjects were from 31 to 35 years category.

2) Total Prevalence of Coccydynia :

| Coccydynia | Present | Absent |
|------------|---------|--------|
| % | 9% | 91% |

Table no.2 Prevalence of Coccydynia

Interpretation :

Coccydynia is present in 9% of subjects and absent in 91% of subjects.

3)Oswestry low back pain disability questionnaire.

| Scoring | Minimal 0% to 20% | Moderate 21% to 40% | Severe 41% to 60% | Crippled 61% to 80% | Bed bound 81% to 100% |
|---------|----------------------|------------------------|----------------------|------------------------|--------------------------|
| | 91% | 9% | 0% | 0% | 0% |

Table no.3 Oswestry index

Interpretation:

91% subjects were having minimal disability and 9% subjects were having moderate disability.

4) Visual Analogue Scale

| VAS | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----------|----|---|---|----|----|---|---|---|---|---|----|
| Subjects | 20 | 5 | 9 | 28 | 27 | 9 | 1 | 1 | 0 | 0 | 0 |

Table no.4 VAS

Interpretation:

Out of 100 subjects 20 subjects found with 0 vas,5 subjects found with 1 vas,9 subjects found with 2 vas,28 subjects found with 3 vas,27 subjects found with 4 vas,9 subjects found with 5 vas,1 subjects found with 6 vas,1 subjects found with 7 vas.

Discussion:

The Coccydynia comes under one of most painful condition which limits sitting. The bike riders sit for prolonged time due to their occupation. Coccydynia patients have complaints of pain in and around the coccyx without significant low back pain. Coccydynia can occur due to various causes such as fall on the bottom of seat, kick, hard stool, obstetric trauma, idiopathic and avascular necrosis of coccyx.¹ Normal range of motion of coccydynia should be approximately 13⁰.⁶

This study was focused on prevalence of Coccydynia in long term bike riders. The study was conducted in karad. The age group of Subject is 20-35. 21 participant in between age group of 20-25. 35 participants in between age of 26-30. 44 participants are in between age group of 31-35. Coccydynia is well known disorder but rarely studied disorders so we have need to study of this population. The bike riders are prolonged sitting without backrest they are at the risk of developing Coccydynia.

The incidence of coccygeal angle has been described before, under the name of base angle. It is defined as the angle of coccyx strikes the seat when the person is sitting down. The coccygeal angle of incidence determines the direction sagittal movement of coccyx. The coccygeal angle of incidence is low, coccyx will be more or less parallel with sitting surface at moment of contact. While sitting down on the seat there will be flexion of the coccyx due to the pressure exerted by the seat. At the moment of contact the angle of incidence is large and coccyx is more or less oblique or perpendicular to the seat on the surface.⁹

Coccyx has several important functions. It is insertion site for various muscle, ligaments and tendons and acts as a leg of tripod with ischial tuberosities provides weight bearing support to an individual when in sitting position. Lateral edges moving anteriorly and posteriorly serves as insertion site for coccygeal muscle, sacrotuberous ligament, sacrospinous ligament and

fibres of the gluteus maximus muscle. Tip of the coccyx is the insertion for iliococcygeus muscle tendon.¹¹

The Aim of the study was to find out the Prevalance of Coccydynia in long term bike riders. The Objective was To assess the prevalence of coccydynia in long term bike riders due to prolonged sitting. To find out the effect of prolonged sitting on long term bike riders.

The inclusion criteria were age group between 20-35 years, All subjects should be long term bike riders, Male subjects are taken for the study, Subjects should own a bike (Not fancy bikes), Daily 4-5 hours bike riding, 5-10 years experience. The exclusion criteria were Patients with lumbar spine pathologies, Subjects with history of previous low back pain, Subjects previously diagnosed with sciatica, Subjects with previous history of sacroiliac joint dysfunction, Sports bike owner or rider.

During the survey subjects were collected from karad. After getting ethical clearance from the institutional ethics committee a prior written consent was taken from bike riders. The motive and procedure of the study was thoroughly explained to the subjects.

Each subject was assessed separately in assessment room to maintain the dignity of the patient. Each subject examined separately and record there outcomes. Oswestry low back pain disability questionnaire was given to each subject. The tenderness on the coccyx and pain measured on the basis of VAS Scale.

The data from both the outcome measures was collected.

Data collection was done by using VAS scale and Oswestry low back pain disability questionnaire.

VAS scale 20 participants are 0 pain. 5 participants are 1 pain. 9 participants are 2 pain. 28 participants are 3 pain. 27 participants are 4 pain. 9 participants are 5 pain. 1 participants are 6 pain. 1 participants are 7 pain.

100 Samples were taken out of which 9% subjects had Coccydynia. Oswestry Low back pain disability questionnaire showed in study with 9% subjects are moderate disability and 91% subjects are minimal disability. The intensity of the pain at rest is low as compared to pain while riding. Thus, it can be said that, the prevalence of having Coccydynia in long term bike riders is 9%. These findings reported in the study provide a better understanding of impact and extent of coccydynia.

Conclusion:

In this study, based on the statistical analysis, presentation and interpretations it was concluded that these findings reported in the study provide a better understanding of impact and extent of coccydynia. Coccydynia is a self-limited and mild condition. We found out that there is 9% of prevalence of long term bike riders was having Coccydynia which was moderate pain.

Conflict of interest:

Do not have any conflicts of interest to declare.

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Ethical Clearance:

Ethical clearance was given by Institutional Ethical Committee.

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