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Original article

A PROSPECTIVE STUDY ON CLINICAL PROFILE, DETERMINANTS AND MANAGEMENT OF PATIENTS DIAGNOSED WITH COCCYDYNIA IN A TERTIARY CARE

Dr.Avinash Kumar Katukam[1], Dr Karthik Manchala[2], Dr.GudaRajkamal[3], Dr.Doddoju Veera Bhadreshwara Anusha[4*]

[1]Associate Professor, Department of Orthopaedic surgery, RVM institute of medical sciences and research centre, Siddipet, Telangana.

[2]Associate Professor, Department of Orthopaedic surgery, RVM institute of medical sciences and research centre, Siddipet, Telangana.

[3]Assistant Professor, Department of Orthopaedic surgery, RVM institute of medical sciences and research centre, Siddipet, Telangana.

[4*]Associate Professor, Department of Community Medicine, RVM institute of medical sciences and research centre.

Corresponding Author: Dr Doddoju Veera Bhadreshwara Anusha, Associate professor, Department of Community Medicine, RVM institute of medical sciences and research centre.

Abstract:

Introduction: Coccyx pain is known by multiple synonyms, including coccydynia, coccygodynia, and tailbone pain. Pain in coccydynia can arise from various sources including musculoskeletal issues, nerve impingement, inflammation, and referred pain The history and a well-conducted clinical examination are essential for the management of coccydynia. There is no gold standard for diagnosis of this condition.Although many cases are self-limiting and resolve with little or no medical treatment, other cases are notoriously persistent, are challenging to treat, and are associated with severe and disabling chronic pain.Currently, there is a paucity of research on epidemiology and management of coccydynia hence this study was undertaken.

Methodology: A prospective study was done in 100 patients diagnosed with coccydynia in a tertiary care hospital during 2022 to 2023. Institutional ethical committee clearance and patients written informed consent was obtained. Data on patient's characteristics, duration of pain and morphology of coccyx was noted. Patients scored pain using the numeric rating scale from 0 to 10. Patients' final outcome at follow-up was recorded. Data analysis was done using anova test, chi-square and difference of differences, $P<0.05$ was considered as significant statistically.

Results: Coccydynia was found more common in the age group of 18 – 40 years (54%) followed by 41- 60 years, (32%).Coccydynia was acute in 62% of patients and chronic and refractory in 38%. Pain was reported most common in sitting position (75%) and while travelling (45%).Management was conservative in 88% and interventional procedures done in 39% of patients. Surgical management was done in 3%.

Conclusion: Coccydynia is more prevalent in young age, women and obese. The management of coccydynia should be carried out in a step-wise approach with increasing invasiveness.

Keywords: Coccydynia, epidemiology, clinical profile, Post-acchinni and Massobrio classification, determinants, management, tertiary care.

INTRODUCTION

Coccyx pain is known by multiple synonyms, including coccydynia, coccygodynia, and tailbone pain. It is a disabling condition characterized by pain in the coccyx region of the spine. First used by Simpson in 1859, the word coccydynia is derived from two Greek words ‘coccyx’ and ‘dynia’ where ‘coccyx’ signifies the resemblance to a cuckoo’s beak and ‘dynia’ is a commonly using suffix for pain.[1,2,3]

Coccyx is the terminal triangular bone of the spine composed of three to five segments with variable disc spaces. The cranial most segment of the coccyx articulates with the sacrum. The inter-coccygeal disc spaces, although usually fused (except the first inter-coccygeal joint which is usually segmented), have also been reported to contain intact discs, discs with clefts or fibro-fatty changes or even replaced with synovial joints.[1,4,5] Therefore, along with sacro-coccygeal joint pathological mobility may also be seen in inter-coccygeal joints.

Pain in coccydynia can arise from various sources including musculoskeletal issues, nerve impingement, inflammation, and referred pain. It is important to note that the specific approach to coccydynia can vary depending on the individual's condition and underlying cause. Thorough evaluation by a physician is essential to determine the most appropriate course of treatment.[6]It is a painful and potentially debilitating condition that may be related to trauma, obesity, or other unidentifiable causes.[7]

The history and a well-conducted clinical examination are essential for the management of coccydynia. [8]There is no gold standard for diagnosis of this condition; however, coccyx mobility assessment, pain provocation testing, and imaging have been proposed as reasonable diagnostic approaches. Once correctly diagnosed, treatment options for coccydynia include conservative management and surgical excision.[9]conservative management vary but consist of nonsteroidal anti-inflammatory drugs, manual therapy, and local cortisone injections.[10-15] The overall scope of treatment includes avoiding exacerbating factors (sitting), use of cushions, oral or topical medications, and pain management injections performed under fluoroscopic guidance. Only a small percentage of coccydynia patients require surgical treatment, which is amputation of the coccyx (coccygectomy).

Although many cases are self-limiting and resolve with little or no medical treatment, other cases are notoriously persistent, are challenging to treat, and are associated with severe and disabling chronic pain. Patients often report difficulty getting a specific diagnosis for the cause of their coccyx pain and note that their treating clinicians seem dismissive of this condition.[16]

Clinicians should understand the wide variety of modern options available to diagnose and treat coccydynia. [17]Currently, there is a paucity of research on epidemiology and management of coccydyniain adults hence this study was undertaken.

METHODOLOGY

A prospective study was done in orthopaedic department of a tertiary care hospital during 2022 to 2023. Institutional ethical committee clearance was obtained. Patients diagnosed with coccydynia were enrolled in to study after their written informed consent. The diagnosis of coccydynia was made by aorthopaedic surgeon based on a thorough medical history, clinical examination and imaging with either coccygeal radiographs, MRI, or both. Purposive sampling method was used and 100 patients diagnosed with coccydynia were enrolled. Patients less than 18 years and not willing to participate and incoherent were excluded from the study.

Patient characteristics were recorded, including the aetiology of the coccygeal pain and the history of onset. The presence of pain in the following domains: sitting, leaning forward, rising from a sitting position, during defecation, while walking or jogging, and while travelling were recorded. The condition was regarded as chronic if patients had been symptomatic for more than two months. Rectal examination was done when needed to note the presence of pain from local pressure, reproduction of pain by manipulation of the coccyx, and coccygeal hypermobility.

Post-acchinni and Massobrioinitially classified the morphological variants into four types to which two more types were further added by Nathan et al, this was used for morphological characterizationbased on radiological assessment.

Type I gentle ventral curvature with caudally pointed apex of the coccyx.

Type II more prominent ventral curvature with apex pointing anteriorly.

Type III Acute anterior angulation without subluxation

Type IV Subluxation at sacro-coccygeal or inter-coccygealjoint.

Type V Retroverted with posteriorly angulated apex

Type VI Scoliotic or laterally subluxated coccyx. [18]

All patients had been advised some form of conservative treatment during out-patient examination. Patients not getting better were offered a targeted lidocaine/corticosteroid injection at the subsequent out-patient visit. We used a standardized method of direct injection in the most painful level of the coccyx, usually the sacrococcygeal or Co1-Co2 level, under digital intrarectal control without fluoroscopic imaging as described by Kersey [19] and Finsen.[20] In case of treatment failure with injection therapy, patients were offered surgery with partial or total coccygectomy, with the technique described by Key.[21] All treated patients were reviewed clinically up to three months.

Patients scored pain using the numeric rating scale from 0 to 10. Pain in the previously registered domains and overall result were recorded. Patients final outcome at follow-up scored in the following fashion: completely well, much better, somewhat better, unchanged, or worse. Patients who were completely well or much better at final follow-up were regarded as successfully treated. If the patients were either somewhat better, unchanged, or worse were regarded as treatment failures.

Data entered in Ms excel. Categorical variables were expressed in frequencies and percentages, continuous variables as mean and SD. SPSS version 22 was used.Statistical analysis was done using chi square test,anova test and Differences in differences of pain score premanagement and post management were analysedwith P <0.05 considered as significant statistically.

RESULTS

The age of the participants ranges from 18 years to 65 years, more common in the age group of 18 – 40 years (54%) followed by 41- 60 years, (32%) with mean and SD of age being 44.5± 13.3. More prevalent in Females (78%), less common in males (22%). More common in overweight (43%) followed by obese (32%) patients. (table1)

Table 1: Distribution of study participants by patients' characteristics

Patient characteristic	Group	Frequency (%)
Age	18-40 Years	54 (54%)
	41-60 Years	32 (32%)
	>60 years	14 (14%)
	Mean ±SD	44.5±13.3
Gender	Male	22 (22%)
	Female	78 (78%)
BMI	Underweight	3 (3%)
	Normal	22 (22%)
	Overweight	43(43%)
	Obese	32 (32%)

Coccydynia was acute in 62% of patients and chronic and refractory in 38%. Pain was reported most common in sitting position (75%) and while travelling (45%), followed by rising (32%) and on defaecation (27%) and leaning forward (25%). Few reported pain on jogging / walking (12%). Most common aetiology was fall in 25%, followed by infection in 23%, other causes of coccydynia include Sports (9%), Cancer pain (2%), Iatrogenic (8%), birth related (16%). Cause was not known in 17%. (table 2)

Table 2: Clinical profile of patients with coccydynia

Clinical profile	Subcategory	Frequency (%)
Duration of coccydynia	Acutecoccydynia (< 3 months)	62 (72%)
	Chronic or refractory coccydynia(> 3 months)	38 (28%)
Presenting complaints	Pain on symmetrical sitting	75(75%)
	Pain on rising	32 (32%)
	Pain on defecation	27 (27%)
	Pain on walking or jogging	12 (12%)
	Pain while travelling	45 (45%)
	Pain on leaning forward	25 (25%)
Aetiology	Fall	25(25%)
	Sports	9(9%)
	Cancer pain	2(2%)
	Infection	23(23%)
	Iatrogenic	8(8%)
	Birth related	16(16%)
	Not known	17(17%)

As per Post-acchinni and Massobrio classification of Coccygeal morphology, coccyx was Type 1 in 45 patients, Type 2 in 18 patients, Type 3 in 13 patients, Type 4 in 11 patients, Type 5 in 8 patients and Type 6 in 5 patients. Coccygeal hypermobility was seen in 23%, luxation in 1% and immobility in 31%. (table 3)

Table 3: Coccygeal morphology of study participants

Morphologic assessment of coccyx		Frequency (%)
Post-acchinni and Massobrio classification of Coccygeal morphology	Type 1	45 (45%)
	Type 2	18 (18%)
	Type 3	13(13%)
	Type 4	11 (11%)
	Type 5	8 (8%)
	Type 6	5 (5%)
Coccygeal hypermobility	Normal	45%
	Immobile	31%
	Hypermobility	23%
	Luxation	1 %

Management was conservative (88%) with u shaped/ wedge shaped Cushions, Physical therapy, massage, stretching in 82%, NSAIDS in 18%. Interventional procedures (done in 39% of patients) included steroid injections in 5%, ganglion blocks in 2%, radiofrequency treatment in 27% and extracorporeal shock wave therapy in 5%. Surgical management done in 3%, with partial resection of the coccyx in 2% and complete resection of the coccyx in 1%. Outcome included successful treatment in 73% and unchanged or worse in 27%. (shown in table 4)

Table 4: Management and outcome of coccydynia

Type of management	Method	Frequency (%)
Conservative treatment (88%)	Cushions, Physical therapy, massage, stretching	82 (82%)
	NSAIDS	88 (18%)
Interventional procedures (39%)	Steroid injections	5(5%)
	Ganglion blocks	2 (2%)
	Radiofrequency treatment	27 (27%)
	Extracorporeal shock wave therapy	5 (5%)
Surgical management (3%)	Partial resection of the coccyx	2(2%)
	Complete resection of the coccyx	1(1%)
Outcome of management	successfully treated	73(73%)
	Unchanged or worse	27(27 %)

Mean BMI was more in patients who underwent surgery (27.8), and interventional procedure (25.6) when compared to conservative management (22.7), this was significant statistically. Only conservative management was done in more proportion of patients with acute coccydynia (64.5%)compared with chronic cases (47.4%) which was significant statistically. Interventional procedures were done in more proportion of patients with chronic coccydynia (44.7%) compared to acute coccydynia (35.5%) which was significant statistically. Mean age, pain score before and after management and outcome has no significant differences with method of management. (table5)

Table 5: Determinants of coccydynia

Variable	Sub group	Only Conservative management(58)	Interventional procedure(39)	Surgical management(3)	P value
Mean age in years (SD)		45.1 (12.2)	48.2 (133)	38.1(15.7)	0.71
Gender	Male(22)	5 (22.7%)	16 (72.7%)	1 (4.5%)	0.006
	Female (78)	53 (67.9%)	23 (29.5%)	2(2.6%)	
Mean BMI		22.9 (2.3)	25.6(1.7)	27.8(4.9)	0.001
Duration of coccydynia	Acute (62)	40 (64.5%)	22 (35.5%)	0	0.02
	Chronic (38)	18 (47.4%)	17 (44.7%)	3 (7.9%)	
Mean Pain score (SD)	Pre management	6.9 (3.4)	8.3 (3.1)	9 (1.2)	1.75
	Post management	9.1 (2.3)	8.5 (1.2)	9.1(2.2)	
Outcome	successfully treated (73)	40 (69.8%)	30 (27.4%)	3 (2.7%)	0.91
	Unchanged	18 (66.7%)	8 (29.6%)	1 (3.7%)	

	or worse (27)				

DISCUSSION

Despite the identification of coccygeal pain hundreds of years ago, its treatment can be difficult and sometimes controversial because of the multifactorial nature of coccygeal pain.

In this study the age of the participants ranges from 18 years to 65 years, more common in the age group of 18 – 40 years (54%) followed by 41- 60 years, (32%) with mean and SD of age being 44.5± 13.3. previous study by Lirette et al and Fogel et al stated that coccydynia is five times more prevalent in women than men [22,23]. The higher prevalence is thought to be due to injuries that occur during childbirth as well as the coccyx being located more posteriorly in women and thus more susceptible to external trauma [24]. In study by Gonnade N etal, the mean age of the patients suffering from chronic coccydynia was 42.9 ± 8.39 years, and patients' age range was 28-57 years. [25]

In this study coccydynia was more common in overweight (43%) followed by obese (32%). Study by Maigne JY et al stated that, the exact incidence of coccydynia has not been reported; however, factors associated with increased risk of developing coccydynia include obesity and female gender.[26]

In this study morphological assessment of coccyx showed Type 1 in 45 patients, Type 2 in 18 patients, Type 3 in 13 patients, Type 4 in 11 patients, Type 5 in 8 patients and Type 6 in 5 patients. Study by Garg B et al stated that Type III to VI were found to have a significantly higher incidence in patients with coccydynia, whereas type II was found to have somewhat higher incidence in patients with coccydynia. Type I had a lesser incidence in patients with coccydynia when compared to normal subjects. Presence of a posterior spicule was found to be present in 14% of coccydynia patients and is known to be a significant factor in causing chronic adventitious bursitis due to irritation of soft tissues, especially in Type V coccyx.[1]

In this study, coccygeal hypermobility was seen in 23%, luxation in 1% and immobility in 31%. In study by Grgic V et al, mentioned that abnormal mobility of coccyx, which can be seen on dynamic radiograph (lateral X-rays of the coccyx in the standing and sitting position), is the most common pathological finding in patients with coccygodynia (70% of patients).[27]

In this study management was conservative (88%) with u shaped/ wedge shaped Cushions, Physical therapy, massage, stretching in 82%, NSAIDS in 18%. Interventional procedures (done in 39% of patients) included steroid injections in 5%, ganglion blocks in 2%, radiofrequency treatment in 27% and extracorporeal shock wave therapy in 5%. Surgical management done in 3%, with partial resection of the coccyx in 2% and complete resection of the coccyx in 1%. Outcome included successful treatment in 73% and unchanged or worse in 27%. Fogel GR et al, Capar B et al and Trollegaard et al stated that conservative therapy was successful in 90% of the patients suffering from coccydynia.[28,29,30].Ergonomic

adaptations asdescribed above with non-steroidal anti-inflammatory medicationsare the first modalities to be employed for the management. [1]

CONCLUSION

Coccydynia is more prevalent in young age, women and obese. The management of coccydynia should be carried out in a step-wise approach with increasinginvasiveness. Conservative management is important. Finally, for resistant and recalcitrant cases, coccygectomy has shown excellent medium to long term outcomes.

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