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EVALUATION OF RISK FACTORS ASSOCIATED WITH PILONIDAL SINUS DISEASE IN ERBIL, IRAQ

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ABSTRACT

Background and Objectives: Sacrococcygeal pilonidal disease (SPD) is a common surgical disorder among young adults. This study aims to investigate the risk factors related to pilonidal sinus disease in Erbil, Iraq, focusing on identifying significant contributors and improving understanding of its causes. **Methods:** Data were gathered through a structured questionnaire regarding various risk factors, including age, gender, body mass index, occupation, daily sitting duration, weekly shower frequency, prior instances of pilonidal sinus disease in other areas, and family history of SPD. This prospective case-control study examined a total of 55 individuals, comprising 29 controls with complaints unrelated to SPD and 26 patients diagnosed with SPD. **Results:** Family history, hair type, and sweat production were identified as significant contributors to the development of SPD. The unadjusted odds ratios (ORs) indicated a substantial risk: family history (OR 17.5, $p < 0.001$), excessive sweating (OR 8.52, $p < 0.001$), and coarse body hair (OR 6.25, $p = 0.004$). Furthermore, infrequent bathing and body hair density both emerged as factors of interest with ORs of 3.68 ($p = 0.02$) and 4.1 ($p = 0.015$), respectively. **Conclusion:** Individuals with coarse body hair, excessive sweating, and a family history of sacrococcygeal pilonidal sinus disease are at higher risk for this condition. Improving personal hygiene and removing hair in the intergluteal area are critical for these individuals.

KEYWORDS: Pilonidal sinus; sacrococcygeal pilonidal sinus; risk factor assessment.

INTRODUCTION

Sacrococcygeal pilonidal sinus disease, characterized by the formation of a hair-filled sinus in the midline of the intergluteal cleft—predominantly at the upper base of the coccyx which may progress to inflammation, potentially resulting in abscess or fistula formation.[1,2] This condition is recognized widely as a leading cause of surgical interventions and ranks among the most frequent surgical cases globally.[1,3] It was first described by Herbert Mayo in 1833 as a disease with a hair-filled cyst at the base of the coccyx, Abraham Wendell Anderson later published the first official description of this disease in 1847. Still, Richard Manning Hodges is credited with giving it the name of Pilonidal sinus, which comes from its appearance as a hair filled nest.[4,1,2]

The pathophysiology of SPD remains contentious, with two primary theories: congenital and acquired.[2] The congenital theory posits that infections arise from pre-existing abnormalities originating from ectodermal coalescence during fetal development, evidenced by familial cases.[2] Conversely, the most widespread theory accepted to explain how pilonidal disease develops is the acquired theory, which focuses on hair follicles. As per this theory, repeated friction and microtrauma in the hair follicles and this also occurs in

conjunction with the negative pressure created by the motion and stretching of the gluteal cleft, resulting in the dilation of the follicles and penetration of hair beneath the skin. Apart from these factors, broken or shed hairs from the buttocks or elsewhere may be deposited in the intergluteal area, allowing them to burrow into the skin and in turn give rise to a pilonidal sinus. These single or group mechanisms, as well as the persistent traction of the gluteal cleft, slowly and progressively pulls hair and debris into deeper subcutaneous tissue, eventually producing chronic inflammation. Secondary collateral tracts may then develop on the primary sinus tract and continue to open onto the skin surface as granulation tissue–lined, discharge-producing sinuses.[2] Clinically, this seems to be anal fistula or hidradenitis suppurativa. However, one important distinguishing characteristic of sacrococcygeal pilonidal disease (SPD) is the presence of a midline primary pit in the natal cleft, usually oriented toward the cephalad. In contrast, when there are no midline pits, or when they drain laterally towards the coccyx -- or caudally -- other diagnoses should be considered.[5,6]

Common risk factors associated with SPD include male sex, elevated BMI, dense body hair, stiff or coarse hair, prolonged sitting-related occupations, deep natal cleft, poor hygiene, and excessive sweating.[1,2] While the disease is commonly seen in men and hairy people, there are only a few studies demonstrating the extent of the effect of these risk factors on the development and progression of SPD, as most of them focus on the role of obesity alone on the development of SPD.[1] As well as the lack of studies regarding the prevalence or risk factors of this disease in the population of Iraq.

This study aims to evaluate the clinical significance of the proposed risk factors within the general population of Erbil, Iraq, to determine their association with SPD, to assess the statistical weight of each factor in the development of SPD, and to demonstrate the reduced risk of SPD in their absence.

2. METHODOLOGY

Study Design

An analytical case-control format was utilized to evaluate the data comprehensively.

Study Setting

Conducted across several primary care centers in Erbil, Iraq, involving 55 participants.

Timeframe

The study conducted from October 27, 2023, to March 10, 2024; data collection was undertaken from February 1 to March 1, 2024.

Patient Selection

Study Group: Patients presenting with SPD diagnoses.

Control Group: Patients without SPD symptoms.

Physical exams and clinical interviews were conducted, excluding symptomatic individuals from the control cohort and those unwilling to participate were also excluded from the control group.

Data Collection

A dedicated form was used to gather information regarding risk factors relevant to SPD. Physicians were instructed to fill out these forms following physical examinations, incorporating both qualitative and quantitative inquiries. Key variables assessed included occupation, sitting duration, body hair characteristics determined by the assessor, hygiene frequency, sweatiness levels, family history of SPD, and BMI, calculated using standard methods.

Data Description

BMI was calculated with the classic formula of weight (kg) / (height (m))^2 and was divided into underweight (BMI <18.5) Normal (BMI 18.5-24.9) Overweight (BMI 25-29.9), Obese (BMI >30). Weight and height were asked directly by the physician during the clinical encounter and were recorded on the data collection form.

The amount of time seated was asked by the physician directly and the answers were directly recorded on the data collection form. Hygiene was recorded as the number of times the patient would take a shower per week. Body hair rate is classified through the examination which is by the physician.

3. RESULTS

Among the participant cohort (29 SPD cases, 26 controls) analysed statistically, 82% were male and the predominant age group was 21-30 years (47.3%). The detailed demographic distribution is presented in the table below.

Table 1: Distribution according to demographic parameters.

Variable		No. (%)
Sex	Male	45 (81.8%)
	Female	10 (18.2%)
BMI	Normal	20 (36.4%)
	Overweight	25 (45.4%)
	Obese	10 (18.2%)
Sweatiness	Slightly	36 (65.45%)
	Excessively	19 (34.55%)

Family history proved to be significant (p 0.001), and the most important risk factor, with an unadjusted odds ratio of 17.5 (95% CI 2.048-149.5). Body hair character was also found to be significant with the study group having 3 times more coarsely-haired individuals than those with smooth and thin hair. Binary regression was done using smooth and thin as the reference category and it was found to be significant (p 0.003) with an unadjusted odds ratio of 6.25 (95% CI 1.2-11). The body-hair rate of the participants was found to be a significant risk factor (p 0.038) with hairy people being 4.1 times more likely to

develop the disease than those with no or little body hair (95% CI 1.2-13.2). Sweatiness was the risk factor found to be most significant ($p < 0.001$) with an unadjusted OR of 8.52 (95% CI +2.29-31.2). The last risk factor found to be significant (p 0.02) was the hygiene of the participants calculated through the number of baths or showers they take in a week. Individuals with poor hygiene, defined as less than 5 showers or baths per week, were found to have an unadjusted OR of 3.68 (95% CI 1.2-11.29). Other risk factors proved to be insignificant.

Table 2: Risk factors.

Variable	Unadjusted OR	P-value	95% CI
Family History	17.5	0.001	(2.048–149.551)
Body hair character	6.25	0.004	(1.69–23.06)
Sweatiness	8.52	<0.001	(2.297–31.62)
Body hair rate	4.1	0.038	(1.27–13.21)
Bathing	3.68	0.02	(1.200–11.293)

DISCUSSION

The etiology and risk factors associated with pilonidal sinus remain a subject of debate within the medical community. Although the disease typically affects the younger male population, our data showed no statistical significance regarding gender. Regarding age, Harlak et al. (1) and Shahram et al[3], reported mean ages of 22.49 and 25.1 years, respectively. In contrast, our cohort had a higher mean age of 33 years; however, age was not found to be a statistically significant risk factor.

Bathing frequency and body hair density were both identified as significant factors, which aligns with existing literature. Notably, the *character* of body hair—a variable proposed in this study—demonstrated a higher odds ratio than hair density alone.

While previous studies report mixed results regarding family history, our analysis identified it as a significant factor with the highest odds ratio. This strong association may be explained by shared hygiene habits and hereditary hair characteristics among family members. These findings concur with Shahram et al. but contrast with Harlak et al. Finally, excessive sweating, which was not assessed in the other studies, was also found to be a significant risk factor.

We observed no statistical significance concerning age or gender, likely a result of the smaller sample size and the difficulty of examining female patients in our community. Furthermore, despite the condition's colloquial name ('Jeep disease') and its suggested link to long driving hours, our data showed no significant correlation with occupation, time spent seated, or seat hardness ($p > 0.5$).

While Harlak et al. supported our findings regarding occupation, Shahram et al. found all three of these factors to be significant. Contrary to other studies, BMI was not a significant risk factor in our data, a discrepancy that may be explained by population differences or sample size limitations.

CONCLUSION

Higher hair density, coarse hair texture, positive family history, and poor hygiene may predispose patients to developing pilonidal sinus disease. Enhanced hygiene protocols, including regular bathing and targeted cleaning of the intergluteal region, may significantly reduce SPD incidence among at-risk populations.

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