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Original Research

Obesity, Hypertrichosis and Sex Steroids: Are these Factors Related to the Pilonidal Sinus Disease?

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Abstract

Objectives: Pilonidal sinus disease causes chronic inflammation of the skin and subcutaneous fatty tissue, and it commonly localises in the sacrococcygeal region. This study evaluated the effects of hypertrichosis, family history, obesity and sex steroids in 298 patients with pilonidal sinus disease.

Methods: The medical records of 618 patients treated at the General Surgery Clinic of Malatya State Hospital for primary pilonidal sinus disease between January 2014 and December 2017 were evaluated retrospectively.

Results: Female sex and family histories of pilonidal sinus disease and hypertrichosis were significantly higher in patients with than without hypertrichosis (p=0.030, p=0.035, p<0.001). The mean progesterone level was significantly lower in female patients with hypertrichosis than female patients without hypertrichosis (p=0.003).

Conclusion: Being overweight or obese, having an occupation that requires long-time sitting and having a family history predisposed to developing pilonidal sinus disease.

Keywords: Hypertrichosis; obesity; pilonidal sinus; sex steroids.

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Pilonidal sinus disease (PSD) is a common, chronic inflammatory disease of the skin and subcutaneous fatty tissue. PSD most often involves the sacrococcygeal region but can occur on the fingers or navel. PSD is mostly observed in a young adult male and is responsible for significant work and school absenteeism.[1] PSD was first described by Mayo in 1833, and the first treatments were described by Anderson in 1844.[2] Symptoms may vary from asymptomatic pits to abscesses that require drainage.[3] The aetiology of PSD has been an ongoing subject of debate, but it is currently thought to be acquired.[4] In 1992, Karydakis described the involvement of the skin and hair in the deep intergluteal cleft in the development of PSD.[5] This study evaluated the effects of hypertrichosis, family history, obesity and sex steroids in 298 patients with PSD.

Methods

The medical records of 618 patients treated at the General Surgery Clinic of Malatya State Hospital for primary PSD between January 2014 and December 2017 were evaluated retrospectively. Three patients with psychiatric disorders, five with diabetes mellitus, seven with active abscesses, six receiving steroid therapy for other medical conditions and 13 without regular clinical follow-up were excluded from

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this study. The demographic characteristics, body mass index (BMI), family history of PSD, hypertrichosis, history of previous abscess formation, daily sitting time, preoperative antibiotic use, progesterone and testosterone levels, duration of surgery, hospital stay, postsurgical drain usage and drainage volume, time of suture removal and postoperative complications were evaluated in the remaining 584 patients.

Patients with acute inflammation were operated on after one week of treatment with anti-inflammatory drugs and antibiotics. All patients had a bath the night before the surgery and were admitted to the hospital on the day of the procedure. A single 1 g dose of prophylactic cefazolin sodium was administered before making the surgical incision. The operative field in the presacral area was shaved with an electric razor and cleaned with povidone-iodine. En bloc resection of the pilonidal sinus and healthy surrounding tissue was performed with the Karydakis procedure beginning with an asymmetric elliptical incision to the level of the presacral fascia, mobilization of the flap to the sacrococcygeal fascia and closure to complete the procedure.

Statistical Analysis

SPSS 15.0 for Windows (SPSS Inc., Chicago, IL, USA) was used for the statistical analysis. Descriptive statistics were reported as means±standard deviation, medians, minimum and maximum. Categorical variables were reported as numbers and percentages. The Mann-Whitney U test was used to compare differences in independent numerical variables with normal distributions. Differences in ratios were tested for significance by the chi-square test. Monte Carlo simulations were used to control for the influences of random variables. P<0.05 were considered to be statistically significant.

Ethical Approval: All procedures in this study performed by following the Helsinki Declaration. Also, the Istanbul, Okan University, Ethical Board approved the study protocol (09.05.2018/ 94).

Results

Of the 517 patients having sacrococcygeal pilonidal sinus without hypertrichosis, 67 patients having sacrococcygeal pilonidal sinus with hypertrichosis were evaluated. The patient characteristics and family history are shown in Table 1. There were no significant differences in age, sex, height, weight, or BMI. Female sex and family histories of PSD and hypertrichosis were significantly higher in patients with than without hypertrichosis (p=0.030, p=0.035, p<0.001). The mean progesterone level was significantly lower in female patients with hypertrichosis than the patients without hypertrichosis (p=0.003, Table 2). Postoperative complications in patients with and without hypertrichosis, including wound infection, wound dehiscence, abscess formation,

Table 1. Patient characteristics and family history

	Hypertrichosis group (n=67)		Non-hypertrichosis group (n=517)		
	Mean±SD	**Min-Max/Median**	**Mean±SD**	**Min-Max/Median**	**p**
Age	23.5±5.9	14-42/22	24.4±7.0	15-50/22	0.446
Height	171.2±7.8	150-188/172	172.1±7.4	155-188/172	0.379
Weight	74.0±13.5	45-115/73.5	74.8±11.7	40-102/74	0.432
BMI	25.1±3.6	16.1-36.6/24.8	25.1±3.1	15.2-32.7/25.1	0.659
	n	**%**	**n**	**%**	
Family history of PSD	41	40.2	54	28.1	0.035
Hypertrichosis in family	63	61.8	8	4.2	<0.001
Long-time sitting	49	48.0	77	40.3	0.203

Table 2. Progesterone level in men and testosterone levels in men and women

	Hypertrichosis group (n=67)		Non-hypertrichosis group (n=517)		
	Mean±SD	**Min-Max/Median**	**Mean±SD**	**Min-Max/Median**	**p**
Female progesterone	0.94±0.32	0.6-1.9/0.9	1.15±0.31	0.7-1.9/1	0.003
Female testosterone	0.52±0.25	0.2-1.1/0.5	0.52±0.20	0.2-1/0.5	0.743
Male testosterone	4.02±1.57	1.1-7.9/3.9	3.99±1.99	1.2-15/3.8	0.360

Table 3. Postoperative complications

	Hypertrichosis group (n=67)		Non-hypertrichosis group (n=517)		
	n	%	n	%	p
Postoperative complications					
No complications	160	78.8	320	83.9	
Other	2	0.98	2	0.52	
Wound infection	27	13.3	43	11.2	
Wound dehiscence	2	0.98	2	0.52	0.069
Abscess formation	7	3.44	7	1.83	
Flap necrosis	0	0.0	1	0.26	
Postspinale Cephalalgia	5	2.46	6	1.57	

flap necrosis, and cephalalgia after spinal anaesthesia in patients with and without hypertrichosis, were not significantly different (p=0.069, Table 3).

Discussion

A family history, male gender, sex hormone level, being a young adult, obesity, local trauma, hypertrichosis and hyperhidrosis are known risk factors for PSD.[6–8] The mean ages of patients in this study were 23.5±5.9 years in patients with and 24.4±7.0 years in patients without hypertrichosis. The mean BMIs were over 25 kg/m^2 in both groups, which means that the majority of the patients were overweight or obese. Age and BMI were in line with other reports. Bradley reported that overweight contributed to 37%, and obesity to and 13%, of all pilonidal sinus cases.[8] Arda et al.[9] reported that 67.1% of PSD patients were overweight or obese, and both conditions were identified as risk factors for PDS. Other studies by Akinci et al.[10] and Bolandparvaz et al.[11] have found that obesity (BMI >25kg/m^2) significantly increased the risk of PSD. We believe that the wet, fragile deep intergluteal skin of obese and overweight patients predisposes for PSD. Dead hair insertion into existing sinus pits or skin abrasions that arises from rotational movements of the buttocks during walking is the main problem in overweight and obese people.[12]

Chamberlain and Vawter were the first to describe a familial tendency of PSD in 1974,[13] and this has been confirmed by Bradley,[8] Onder A et al.[14] and Doll et al.[15] who reported that 23% to 38% of PSD patients had a family history and concluded that it was a predisposing factor. In this study, family history of the disease is significantly more frequent in patients having hypertrichosis (p=0.035), and hypertrichosis in family members was significantly more frequent in patients with hypertrichosis (p<0.001). We believe that familial hypertrichosis may be a predisposing genetic factor for PSD, but further study is needed for confirmation.

Bolandparvaz et al.[11] reported that more than four hours of daily sitting increased the risk of PSDS, and occupations that require sitting for long periods of time were found by Kayadibi A et al.[16] to predispose for PSD. In this study, sitting time was not significantly different in patients with or without hypertrichosis, but 48% of the patients with hypertrichosis and 40.3% of those without hypertrichosis spent a long-time sitting every day. That is consistent with published data that occupations requiring long-term daily sitting may facilitate PSD.

Female testosterone levels were not significantly different in patients with or without hypertrichosis, but female progesterone was significantly higher in patients with hypertrichosis. Steroid hormones other than androgens have a mild effect on hair growth, but it is difficult to assess the direct effects of progesterone because it influences androgen binding.[17] Sex steroids may have a mild effect on hypertrichosis that is indirectly related to PSD. Prospective, randomized controlled studies with large patient samples are needed to investigate this effect.

Surgical wound infection was the most common complication in both hypertrichosis and non-hypertrichosis patients, but the rates of occurrence were not significantly different. The fragility of intergluteal skin, excessive sweating and high BMI may have increased the risk of wound complications.[18]

Conclusion

The study limitations include its retrospective nature and the limited number of patients makes it difficult to draw firm conclusions. However, the results indicate that being overweight or obese, having an occupation that requires long-time sitting and having a family history predisposed to developing PSD. High progesterone level may create a tendency for this disease, but the relationship requires further investigation in larger patient series.

Disclosures

Ethics Committee Approval: Istanbul Okan University, Ethical Board approved the study protocol (09.05.2018/ 94).

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