ORIGINAL RESEARCH ORİJİNAL ARAŞTIRMA

DOI: 10.5336/dermato.2025-108407

Male Genital Dermatoses in Dermatology Outpatient Clinic: A Cross-Sectional Research

Dermatoloji Polikliniğinde Erkek Genital Dermatozları: Kesitsel Araştırma

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ABSTRACT Objective: Male genital dermatoses include a wide spectrum of disorders. The aim of this study is to define the male genital dermatoses presenting to dermatology and venereology department. **Material and Methods:** A total of consecutive 344 male patients with genital lesions attending dermatology and venereology outpatient clinic were included in this prospective descriptive, observational study. **Results:** The most common diagnosis was condyloma acuminata in 132 (38.3%) patients, followed by scabies in 55 (15.9%) patients and fungal infections in 19 (5.52%) patients. Age of the patients (p=0.001), presence of regular sexual activity (p=0.046) first applied department (p=0.004), presence of associated symptom (p=0.001), extragenital skin involvement (p=0.001), duration of the disease (p=0.001), involvement site (p=0.001) showed significant difference between subgroups when diseases were classified into 4 categories based on the etiology as follows: benign conditions, infectious diseases, inflammatory diseases and premalignant/malignant diseases. Diseases were also evaluated in terms of way of transmission as follows: sexually transmitted diseases, contagious diseases and non-contagious diseases. Age of the patients (p=0.003), education levels of the patients (p=0.001), presence of associated symptom (p=0.001), extragenital skin involvement (p=0.001), duration of the lesion (p=0.002) and the type of the lesion (p<0.01) showed significant difference between these subgroups. **Conclusion:** Public education programs informing patients about sexually transmitted diseases will be beneficial in reducing sexually transmitted diseases.

Keywords: Condyloma acuminata; genital dermatoses; infectious diseases; neoplasms; sexually transmitted diseases

ÖZET Amaç: Erkek genital dermatozları geniş bir hastalık yelpazesini içerir. Bu çalışmanın amacı, dermatoloji ve veneroloji polikliniğine başvuran erkek genital dermatozlarını tanımlamaktır. **Gereç ve Yöntemler:** Bu prospektif, tanımlayıcı, gözlemsel çalışmaya, dermatoloji ve veneroloji polikliniğine genital lezyonlar ile başvuran toplam 344 ardışık erkek hasta dâhil edilmiştir. **Bulgular:** En sık görülen tanı, 132 hastada (%38,3) kondiloma aküminata olup, bunu 55 hastada (%15,9) uyuz ve 19 hastada (%5,52) fungal enfeksiyonlar takip etmiştir. Hastalar etiyolojiye göre benign durumlar, enfeksiyöz hastalıklar, inflamatuar hastalıklar ve premalign/malign hastalıklar olmak üzere 4 kategoriye ayrıldığında; yaşları (p=0,001), düzenli cinsel aktivite varlığı (p=0,046), ilk başvurulan bölüm (p=0,004), eşlik eden semptomların varlığı (p=0.001), ekstragenital deri tutulumu (p=0,001), hastalık süresi (p=0,001) ve tutulum bölgesi (p=0,001) açısından gruplar arasında anlamlı farklılık izlendi. Hastalıklar ayrıca bulaşma yoluna göre cinsel yolla bulaşan hastalıklar, bulaşıcı hastalıklar ve bulaşıcı olmayan hastalıklar olarak değerlendirildi. Bu gruplar arasında hastaların yaşı (p=0,003), eğitim düzeyleri (p=0,001), eşlik eden semptomların varlığı (p=0,001), ekstragenital deri tutulumu (p=0,001), lezyon süresi (p=0,002) ve lezyon tipi (p<0,01) açısından anlamlı fark bulundu. **Sonuç:** Cinsel yolla bulaşan hastalıklar konusunda halkı bilgilendiren eğitim programları, cinsel yolla bulaşan hastalıkların azaltılmasında faydalı olacaktır.

Anahtar Kelimeler: Kondiloma aküminata; genital dermatozlar; enfeksiyöz hastalıklar; neoplazmlar; cinsel yolla bulaşan hastalıklar

TO CITE THIS ARTICLE:
Semiz Y, Özkır I, Eşrefoğlu S, Oğuz Topal İ. Male genital dermatoses in dermatology outpatient clinic: A cross-sectional research. Turkiye Klinikleri J Dermatol. 2025;35(2):59-68.

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Peer review under responsibility of Turkiye Klinikleri Journal of Dermatology.

Received: 13 Jan 2025 ***Received in revised form:*** 18 Mar 2025 ***Accepted:*** 23 Apr 2025 ***Available online:*** 07 Jul 2025

Genital dermatoses are defined as skin disorders on the reproductive organs, encompassing a range of conditions such as benign lesions (e.g., Fordyce spots, angiokeratomas), infectious diseases (venereal like condyloma acuminata, human immunodeficiency virus (HIV), syphilis, or nonvenereal like staphylococcal folliculitis), inflammatory skin diseases (e.g., psoriasis, seborrheic dermatitis), malignant conditions (e.g., melanoma, Bowen's disease), and allergic or traumatic reactions. These conditions vary in scope; some are localized to the genital area, while others may involve generalized skin changes. Patients with genital skin disorders may initially present to specialties outside dermatology, potentially delaying proper diagnosis and treatment. Genital dermatoses can significantly affect physical, psychological, and sexual well-being, often causing anxiety.[1,2] This study aims to define the male genital dermatoses presenting to dermatology and venereology department. By examining a wide spectrum of conditions, it seeks to document prevalence, clinical features, and demographic factors associated with these diseases, providing valuable insights for more effective management. Additionally, the study addresses modes of disease transmission-classifying conditions as sexually transmitted, contagious, or non-contagious-and explores patients' understanding of transmission. The study is original in its comprehensive, clinic-based assessment of genital dermatoses within a large sample, and it is unique in classifying these conditions based on modes of transmission and examining patient awareness of transmission risks.

MATERIAL AND METHODS

The study was reviewed and approved by the local ethics committee (date: November 08, 2021; no: 379), and all the participants gave written informed consent. The study was carried out according to the principles expressed in the Declaration of Helsinki.

A prospective, descriptive, observational, cross-sectional study was conducted to identify the genital diseases of male patients. A total of consecutive 344 male patients with genital lesions attending dermatology and venereology outpatient clinic between December 2021-March 2023 were included. All male patients were above 18 years of age, presenting with genital lesions. A detailed history including demographic data, complaints related to skin, site of involvement, type of the skin lesion, onset and duration of the disease, and associated cutaneous or systemic disorders were noted. History of sexual exposure was also recorded. A total skin examination was performed on all subjects. Examination of dermoscopy, wood lamp, potassium hydroxide test and biopsy for histopathologic study were done when required to make the correct diagnosis. All the patients were screened for hepatitis B virus (HBV), hepatitis C virus (HCV), HIV infections and syphilis by assessing serum hepatitis B surface antigen, anti-hepatitis B surface antibody, anti-HCV, anti-HIV, venereal disease research laboratory, treponema pallidum hemagglutination levels.

The diagnoses of the patients were recorded which were classified into 4 categories based on the etiology as follows: benign conditions, infectious diseases, inflammatory diseases and premalignant/malignant conditions.

Diseases were also classified as sexually transmitted diseases (STD), contagious diseases (CD) (that may be transmitted by any kind of contact such as fungal or bacterial infections) and non-CD. Patients' knowledge about type of the transmission of the disease was also questioned.

STATISTICAL ANALYSIS

Statistical analyses were carried out using the Number Cruncher Statistical System (NCSS) 2007 (Kaysville, Utah, USA). The descriptive data were expressed with mean±standard deviation, numeric variables, frequency, and percentages. In the analysis of normally distributed variables, a Shapiro-Wilk test was applied. Kruskal-Wallis test was applied in the analysis of independent groups when there were more than 2 groups and Bonferroni-Dunn test was used in paired comparisons. Fisher-Freeman-Halton exact test were used to compare qualitative variables. $p<0.05$ was considered statistically significant.

RESULTS

The demographic features and the disease characteristics of the patients are shown in Table 1. Clinical

TABLE 1: Demographic data and clinical features of the patients

		Minimum-maximum (median)	X̄±SD
Age (years)		19-78 (35)	37.7±12.7
		n	%
Regular sexual activity	None	145	42.2
	Yes	199	57.8
Primary department applied	Dermatology	268	77.9
	Urology	64	18.6
	Others	12	3.5
	Emergency medicine	4	1.2
	Family medicine	2	0.6
	Infectious diseases	3	0.9
	General surgery	3	0.9
Skin biopsy required	No	312	90.7
	Yes	32	9.3
Associated symptom	None	155	45.1
	Yes	189	54.9
Symptoms (n=189)	Pruritus	158	83.6
	Pain	27	14.3
	Erythema	83	43.9
	Desquamation	26	13.8
	Burning sensation	16	8.5
	Bleeding	3	1,6
Extragenital skin involvement	No	241	70.1
	Yes	103	29.9
		Minimum-maximum (median)	X̄±SD
Duration of the lesion (days)		3-5,000 (90)	374.1±752.2
		n	%
Localization	Mons pubis	220	64.0
	Penis shaft	176	51.2
	Glans penis	78	22.7
	Scrotum	109	31.7
	Perianal area	50	14.5
	Perineum	21	6.1
	Others	2	0.6
Description of the lesion	Macule	33	9.6
	Patch	39	11.3
	Papule	250	72.7
	Plaque	77	22.4
	Vesicle	7	2.0
	Bulla	3	0.9
	Nodule	28	8.1
	Cyst	5	1.5
	Pustule	9	2.6
	Abscess	10	2.9
	Ulcer	8	2.3
Number of the lesions	Single	46	13.4
	2-5	136	39.5
	6-10	99	28.8
	≥11	63	18.3
Treatment	None	21	6.1
	Yes	323	93.9
Treatment type (n=323)	Local	241	74.6
	Systemic	9	2.8
	Local+systemic	73	22.6

SD: Standard deviation

pictures of cases are shown in Figure 1, Figure 2, Figure 3, Figure 4.

A total of 344 male patients with genital dermatoses were included in the study. All the patients included were circumcised. Mean age of the patients was 37.7±12.7 years. The mean duration of the genital lesions of patients was 374.1±752.2 days. 268 (77.9%) patients first applied to dermatology department while 64 (18.6%) to urology department and 12 (3.5%) to other departments. 189 (54.9%) of the patients had an associated symptom while 155 (45.1%) did not have any symptoms. The most common symptom was pruritus presented in 158 (45.9%) of the patients. 250 (72.7%) patients had papules, 77 (22.4%) had plaques, 39 (11.3%) had patches, 33

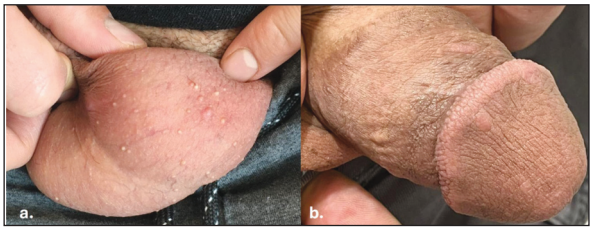

FIGURE 1: a) Multiple milia on the scrotum **b)** Penile pearly papules located on the glans penis.

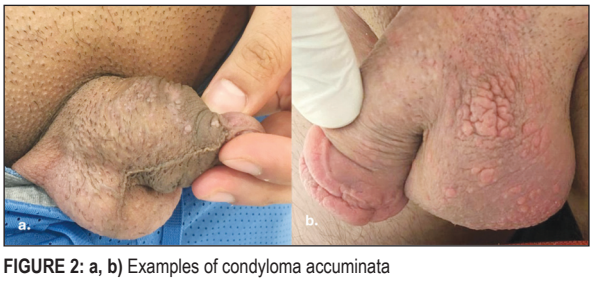

FIGURE 2: a, b) Examples of condyloma accuminata

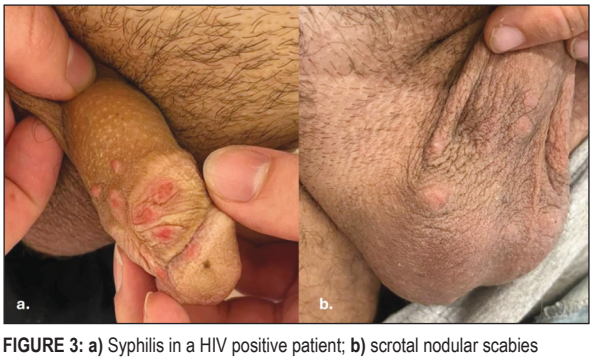

FIGURE 3: a) Syphilis in a HIV positive patient; **b)** scrotal nodular scabies

FIGURE 4: a) Erythematous, eczematous plaque lesion, contact dermatitis; **b)** Atrophic, erythematous patch, lichen scleroatrophicus; **c)** Hyperkeratotic plaque, lichen simplex chronicus **d)** Erythematous-purple papules and plaques, lichen planus

(9.6%) had macules. 298 (86.6%) of the patients had multiple lesions, while 46 (13.4%) had solitary lesion. 241 (74.6%) patients were treated with local therapies. 137 (39.8%) of the patients had a STD, 127 (36.9%) had a non-CD, 80 (23.3%) had CD. In 32 (9.3%) patients histopathologic examination was required to make the correct diagnosis. 103 (29.9%) patients had extragenital cutaneous involvement.

The diagnosis of 47 different diseases/conditions were made, shown in Table 2. The most common diagnosis was condyloma acuminata in 132 (38.3%) patients, followed by scabies in 55 (15.9%) patients and fungal infections in 19 (5.52%) patients. 234 (68%) of the dermatoses were classified as infectious conditions, 71 (20.6%) were classified as inflammatory diseases, 35 (10.2%) were classified as benign conditions and 4 (1.2%) were classified as premalignant/malignant diseases.

Comparisons of the demographic and clinical features between 4 groups is shown in Table 3. The mean age of the patients in infectious disease group was significantly lower than in patients with inflammatory diseases (36.4±12.7 vs 40.8±11.4 years, p=0.011) and in patients with premalignant/malignant diseases (36.4±12.7 vs 56.5±5 years, p=0.02). Regular sexual activity was more common in inflammatory disease group as compared with other subgroups (p=0.046). The rate of dermatology referral at first admission was significantly more common in patients with inflammatory diseases than in patients with benign conditions and infectious diseases (p=0.004, p<0.01; respectively). Presence of associated symptom was significantly higher in inflammatory disease group as compared with other disease groups (p=0.001) and also significantly higher in infectious diseases group as compared with benign conditions group (p=0.001). Extragenital skin involvement was more common in the premalignant/malignant disease group (n=3, 75%) followed by inflammatory disease group (n=31, 43.7%), infectious disease group (n=66, 28.2%) and benign conditions (n=3, 8.6%). Mons pubis localization was significantly lower in patients with benign conditions as compared with other groups (p=0.001). Scrotal involvement was significantly higher in patients with benign conditions as compared with other groups (p=0.004). When diseases were evaluated in terms of lesional characteristics, patch lesions were observed to be more common in patients with inflammatory diseases than in other groups (p=0.001). Papules were significantly more common in benign conditions and infectious diseases groups than in other groups (p=0.001). Plaque lesions were significantly more common in inflammatory diseases and premalignant/malignant disease groups (p=0.001) than in other groups. Demographic and clinical characteristics of the patients according to transmission way of the disease and comparisons between subgroups is shown in Table 4. When diseases were evaluated in terms of STD, CD and non-CD, pruritus was significantly more common in CD group as compared with other 2 groups (p=0.004). Pain was a significantly less common symptom in CD group (p=0.001). Papules were significantly more prevalent in STDs than in CD and non-CD group (p=0.001). In patients with STDs macule, patch, plaque and nod-

TABLE 2: Frequency of genital dermatoses

		n	%
Infectious diseases		**234**	**68**
	Verruca Vulgaris	132	38,3
	Scabies	55	15.9
	Fungal infections	19	5.5
	Dermatophytes	15	4.36
	Candida	4	1.16
	Folliculitis	4	1.16
	Molluscum contagiosum	4	1.16
	Syphilis	4	1.16
	Furuncle	3	0.87
	Abscess	2	0.6
	Balanitis	2	0.6
	Herpes Genitalis	2	0.6
	Impetigo	2	0.6
	Hand-Foot-Mouth disease	1	0.3
	Erythema Intertrigo	1	0.3
	Pityriasis Versicolor	1	0.3
	Cellulitis	1	0.3
	Herpes zoster	1	0.3
Inflammatory diseases		**71**	**20.6**
	Contact dermatitis	19	5.5
	Vitiligo	12	3.48
	Psoriasis	8	2.3
	Lichen simplex chronicus	8	2.3
	Lichen Planus	5	1.45
	Hidradenitis Suppurativa	4	1.16
	Persistant Scrotal Erythema	3	0.87
	Atopic Dermatitis	2	0.6
	Fixed Drug Eruption	2	0.6
	Erythema Multiforme	1	0.3
	Behçet's disease	1	0.3
	Lichen Scleroatrophicus	1	0.3
	Maculopapular Drug Reaction	1	0.3
	Post-Scabies Granuloma	1	0.3
	Urticaria	1	0.3
	Granuloma annulare	1	0.3
	Morphea	1	0.3
Benign conditions		**35**	**10.2**
	Angiokeratoma	8	2.3
	Penile Pearly Papules	6	1.74
	Nevus	4	1.16
	Milium	3	0.87
	Seborrheic keratosis	3	0.87
	Steatocystoma multiplex	3	0.87
	Epidermal cyst	2	0.6
	Fibroepithelioma	2	0.6
	Mucosal Melanosis	2	0.6
	Fox Fordyce Spots	1	0.3
	Scrotal cyst	1	0.3
Premalignant/ malignant conditions		**4**	**1.2**
	Mycosis Fungoides	2	0.6
	Kaposi's Sarcoma	1	0.3
	Verrucous squamous cell carcinoma	1	0.3

ule lesion were significantly less common than in CD and non-CD groups ($p<0.01$, for all). Pustules and abscess were significantly more common in CD group as compared with others ($p=0.042$, $p=0.001$; respectively). Patients in STD group were significantly younger than in non-CD group ($p=0.003$).

DISCUSSION

In this study, 344 male patients with various genital dermatoses, both venereal and non-venereal, were examined. Diagnoses were categorized into benign conditions, infectious diseases, inflammatory diseases, and premalignant/malignant conditions. Infectious diseases were the most common group, with *condyloma acuminata* [genital warts caused by Human Papillomavirus (HPV)] being the predominant condition, present in 38.3% of cases.

Male genital dermatoses include a wide-spectrum of diseases with different etiologies.[1] They include both venereal and nonvenereal diseases. Venereal dermatoses cause mental stress and guilt feeling among patients, it is important to clarify the etiology of the genital dermatoses. Moreover, STDs are a health care problem due to their contagious character.[3] Nowadays, there is a tendency to misdiagnose genital dermatoses as STD, which causes stigmatization and impairment in psychosocial conditions of the patient.[4] While approaching the genital lesions infectious, inflammatory, premalignant/malignant disorders should be considered in the etiology. It should also be kept in mind that diagnoses of genital dermatoses may be challenging since genital dermatoses may present in unusual morphology due to anatomy of the genital area and flexural site involvement.[1,4] Male patients tend to apply to clinicians from various departments other than dermatology such as urology, family medicine which may also cause delays in adequate diagnosis and/or treatment.[3]

There are reports evaluating nonvenereal dermatoses in males.[1,5,6] In one study evaluating nonvenereal genital dermatoses of males 16 different nonvenereal dermatoses were observed, while 25 was reported in another one.[1,6] In our study, both venereal and nonvenereal diseases are evaluated and 47 dif-

TABLE 3: Demographic and clinical characteristics of the patients according to subgroups

		Diagnoses; n (%)				
		Benign conditions (n=35)	Infectious diseases (n=234)	Inflammatory diseases (n=71)	Premalignant/ malignant diseases (n=4)	p value
Age (years)	Minimum-maximum (median)	19-64 (36)	19-78 (33)	19-78 (40)	51-63 (56)	[a]**0.001****
	$\bar{X}$±SD	37.7±13.6	36.4±12.7	40.8±11.4	56.5±5.0	
Regular sexual activity	None	17 (48.6)	106 (45.3)	20 (28.2)	2 (50.0)	[b]**0.046***
	Yes	18 (51.4)	128 (54.7)	51 (71.8)	2 (50.0)	
Primary department applied	Dermatology	24 (68.6)	174 (74.4)	66 (93.0)	4 (100)	[b]**0.004****
	Urology	10 (28.6)	51 (21.8)	3 (4.2)	0 (0)	
	Others	1 (2.9)	9 (3.8)	2 (2.8)	0 (0)	
Skin biopsy required	No	33 (94.3)	233 (99.6)	45 (63.4)	1 (25.0)	[b]**0.001****
	Yes	2 (5.7)	1 (0.4)	26 (36.6)	3 (75.0)	
Associated symptom	None	28 (80.0)	112 (47.9)	13 (18.3)	2 (50.0)	[b]**0.001****
	Yes	7 (20.0)	122 (52.1)	58 (81.7)	2 (50.0)	
Associated symptom (n=189)	Pruritus	5 (71.4)	102 (83.6)	50 (86.2)	1 (50.0)	[b]**0.296**
	Pain	1 (14.3)	20 (16.4)	6 (10.3)	0 (0)	[b]**0,658**
	Erythema	2 (28.6)	46 (37.7)	34 (58.6)	1 (50.0)	[b]**0.033***
	Desquamation	1 (14.3)	15 (12.3)	9 (15.5)	1 (50.0)	[b]**0.351**
	Burning sensation	0 (0)	4 (3.3)	12 (20.7)	0 (0)	[b]**0.002****
	Bleeding	0 (0)	1 (0.8)	1 (1.7)	1 (50.0)	[b]**0.031***
Extragenital skin involvement	No	32 (91.4)	168 (71.8)	40 (56.3)	1 (25.0)	[b]**0.001****
	Yes	3 (8.6)	66 (28.2)	31 (43.7)	3 (75.0)	
	Yes	0 (0)	81 (37.5)	0 (0)	0 (0)	
Duration of the lesion (days)	Minimum-maximum (median)	10-3650 (365)	3-3,650 (90)	3-5,000 (150)	20-3,650 (815)	[a]**0.001****
	$\bar{X}$±SD	896.1±1224.6	196.2±370.2	649.6±1052.6	1325±1596.2	
Localization of the lesions	Mons pubis	9 (25.7)	167 (71.4)	41 (57.7)	3 (75.0)	[b]**0.001****
	Penis shaft	6 (17.1)	136 (58.1)	33 (46.5)	1 (25.0)	[b]**0.001****
	Glans penis	7 (20.0)	47 (20.1)	24 (33.8)	0 (0)	[b]**0.086**
	Scrotum	20 (57.1)	71 (30.3)	18 (25.4)	0 (0)	[b]**0.004****
	Perianal area	1 (2.9)	38 (16.2)	11 (15.5)	0 (0)	[b]**0.157**
	Perineum	1 (2.9)	16 (6.8)	4 (5.6)	0 (0)	[b]**0.906**
	Others	0 (0)	2 (0.9)	0 (0)	0 (0)	[b]**1.000**
Description of the lesion	Macule	6 (17.1)	17 (7.3)	10 (14.1)	0 (0)	[b]**0.118**
	Patch	1 (2.9)	12 (5.1)	26 (36.6)	0 (0)	[b]**0.001****
	Papule	27 (77.1)	197 (84.2)	25 (35.2)	1 (25.0)	[b]**0.001****
	Plaque	3 (8.6)	39 (16.7)	32 (45.1)	3 (75.0)	[b]**0.001****
	Vesicle	0 (0)	4 (1.7)	3 (4.2)	0 (0)	[b]**0.360**
	Bulla	0 (0)	3 (1.3)	0 (0)	0 (0)	[b]**1.000**
	Nodule	6 (17.1)	17 (7.3)	4 (5.6)	1 (25.0)	[b]**0.090**
	Cyst	0 (0)	2 (0.9)	3 (4.2)	0 (0)	[b]**0.193**
	Pustule	0 (0)	6 (2.6)	3 (4.2)	0 (0)	[b]**0.599**
	Abscess	0 (0)	7 (3.0)	3 (4.2)	0 (0)	[b]**0.645**
	Ulcer	0 (0)	5 (2.1)	3 (4.2)	0 (0)	[b]**0.545**
Number of the lesions	Single	6 (17.1)	16 (6.8)	23 (32.4)	1 (25.0)	[b]**0.001****
	2-5	9 (25.7)	93 (39.7)	31 (43.7)	3 (75.0)	
	6-10	6 (17.1)	79 (33.8)	14 (19.7)	0 (0)	
	≥11	14 (40.0)	46 (19.7)	3 (4.2)	0 (0)	
Treatment	None	20 (57.1)	1 (0.4)	0 (0)	0 (0)	[b]**0.001****
	Yes	15 (42.9)	233 (99.6)	71 (100)	4 (100)	
Treatment type (n=323)	Local	15 (100)	195 (83.7)	29 (40.8)	2 (50.0)	[b]**0.001****
	Systemic	0 (0)	5 (2.1)	4 (5.6)	0 (0)	
	Local+systemic	0 (0)	33 (14.2)	38 (53.5)	2 (50.0)	

*p<0.05; **p<0.01; [a]Kruskal Wallis test; [b]Fisher Freeman Halton test; SD: Standard deviation

TABLE 4: Demographic and clinical characteristics of the patients according to transmission way of the disease

		Way of transmission; n (%)			
		Non-CD (n=127)	STD (n=137)	CD (n=80)	p value
Age (years)	Minimum-maximum (median)	19-78 (40)	19-65 (33)	19-78 (35)	[a]**0.003****
	X̄±SD	39.9±13.1	34.5±9.8	39.5±15.3	
Regular sexual activity	None	49 (38.6)	68 (49.6)	28 (35.0)	[c]**0.061**
	Yes	78 (61.4)	69 (50.4)	52 (65.0)	
Associated symptom	None	43 (33.9)	106 (77.4)	6 (7.5)	[c]**0.001****
	Yes	84 (66.1)	31 (22.6)	74 (92.5)	
Symptoms (n=189)	Pruritus	63 (75.0)	25 (80.6)	70 (94.6)	[c]**0.004****
	Pain	20 (23.8)	5 (16.1)	2 (2.7)	[b]**0.001****
	Erythema	50 (59.5)	6 (19.4)	27 (36.5)	[c]**0.001****
	Desquamation	12 (14.3)	2 (6.5)	12 (16.2)	[b]**0.438**
	Burning sensation	13 (15.5)	2 (6.5)	1 (1.4)	[b]**0.004****
	Bleeding	2 (2,4)	1 (3,2)	0 (0)	[b]**0.382**
Extragenital skin involvement	No	86 (67,7)	135 (98,5)	20 (25,0)	[c]**0.001****
	Yes	41 (32,3)	2 (1,5)	60 (75,0)	
Duration of the lesion (days)	Minimum-maximum (median)	3-5,000 (90)	3-3,650 (120)	7-730 (60)	[a]**0.002****
	X̄±SD	653.6±1080.2	273.8±460.3	102.1±114.1	
Description of the lesion	Macule	16 (12.6)	1 (0.7)	16 (20.0)	[c]**0.001****
	Patch	29 (22.8)	3 (2.2)	7 (8.8)	[c]**0.001****
	Papule	57 (44.9)	131 (95.6)	62 (77.5)	[c]**0.001****
	Plaque	44 (34.6)	12 (8.8)	21 (26.3)	[c]**0.001****
	Vesicle	5 (3.9)	2 (1.5)	0 (0)	[b]**0.137**
	Bulla	1 (0.8)	1 (0.7)	1 (1.3)	[b]**1.000**
	Nodule	11 (8.7)	2 (1.5)	15 (18.8)	[c]**0.001****
	Cyst	4 (3.1)	1 (0.7)	0 (0)	[b]**0.209**
	Pustule	7 (5.5)	1 (0.7)	1 (1.3)	[b]**0.042***
	Abscess	10 (7.9)	0 (0)	0 (0)	[b]**0.001****
	Ulcer	3 (2.4)	5 (3.6)	0 (0)	[b]**0.279**

*p<0.05; **p<0.01; [a]Kruskal-Wallis test; [b]Fisher Freeman Halton test; [c]Pearson chi-square test; CD: Contagious diseases; STD: Sexually transmitted diseases; SD: Standard deviation

ferent diagnoses were identified. As dermatoses were evaluated according to etiology, the most common subgroup was infectious conditions, followed by inflammatory diseases, benign conditions and premalignant/malignant diseases in our study.

Condyloma acuminata, usually known as genital warts, are caused by HPV. Genital HPV infections are a common STD with the highest prevalence among men aged 25-29 years and decreases with age.[7] Four percent of sexually active males between the ages 18-59 years were reported to have a diagnosis of genital warts.[8] In the present study 38.3% of the patients presented with a genital dermatose had Condyloma acuminata. Condyloma acuminata in males is associated with psychosocial stress, anxiety and stigmatization. The management of this STD is particularly crucial due to increased risk of malignancies with certain subtypes of HPV. In 2012, HPV-related malignancies were estimated for 8.6% of all cancer cases in women for 0.8% of all cancer cases in men.[9] Circumcision is a recommended prevention method for males to reduce the incidence of genital HPV.[10] Our study population consisted of circumcised males which may suggest that in a uncircumcised population the incidence of HPV infection would be higher.

Scabies was the second most common condition, affecting 15.9% of patients, and was the most prevalent nonvenereal disease. Previously, studies conducted among nonvenereal genital dermatoses rates of scabies were reported as 10-13.5-15%.[1,4,5] Recent increases in scabies prevalence in Europe have been

noted, potentially linked to delayed diagnosis and treatment during pandemic lockdowns.[11]

Fungal infections were found in 5.5% of patients, which is in line with previous studies.[1] Genital dermatophytoses can be transmitted sexually or through autoinoculation. Excessive use of topical or systemic corticosteroids, hot and humid climates, HIV/ Acquired Immune Deficiency Syndrome, atopic dermatitis, immunosuppressive conditions are predisposing factors to genital dermatophytosis.[12]

In this study, the most frequent inflammatory dermatoses were contact dermatitis, vitiligo (3.4% of patients), and psoriasis (2.3% of patients). Contact dermatitis affected 5.5% of patients. Genital contact dermatitis may occur as a primary disease or a secondary phenomenon in the presence of a preexisting genital dermatosis.[13] It was suggested that male genitalia is predisposed to contact dermatitis due to the thin and elastic skin of the penis which makes it more sensitive to allergens and foreign substances.[14] Moreover, foreskin of the penis in uncircumcised men tends to be a more common localization to develop inflammatory dermatoses compared with circumcised men.[15] 9 of 12 vitiligo patients had extragenital skin involvement. In studies evaluating nonvenereal genital dermatoses genital vitiligo was reported to have a prevalence of 16% and 18%.[5,6] Since vitiligo is usually asymptomatic, patients may tend not to seek for healthcare which explains the low prevalence in our study. Psoriasis has a 2% prevalence worldwide, anogenital involvement may also accompany.[16] All psoriasis patients in our study, had typical psoriatic lesions on other body sites except for one patient. In studies conducted among men with nonvenereal genital dermatoses psoriasis was reported to be seen around 2-3% of the patients.[5,6,17] Mucosal part of the anogenital area is a more common involvement site of psoriasis rather than keratinized skin, which results in anogenital psoriasis to be more common among uncircumcised males.[16] Our study population consisted of circumcised males which may have caused lower rates. Dermatitis, vitiligo and psoriasis are the most common inflammatory dermatoses in this study.

Benign conditions were also documented; 2.3% of patients had angiokeratoma, while 1.7% had pearly penile papules. In a study evaluating nonvenereal genital dermatoses among 100 males, pearly penile papules were observed in 16% of the patients, which is far more common than our study. In previous studies, evaluating nonvenereal genital dermatoses angiokeratoma was observed around 1-2% of the patients.[5,6,17] An explanation of low rates of angiokeratoma and penile pearly papules observed in our study, may be the benign and asymptomatic nature of both disorders which may lead patients not to apply to a physician. Secondly, they both persist for a long time causing acceptance to the patient.

In our study only 4 patients had premalignant/malignant disease among 344 participants. 2 of them had mycosis fungoides who were already diagnosed as mycosis fungoides with general skin involvement, 1 had Kaposi's sarcoma who also had lesions on the extremities, 1 had verrucous squamous cell carcinoma limited to genital area. In the study consisting of 200 nonvenereal genital dermatoses, 6 patients was reported to have premalignant/malignant lesions including pseudoepitheliomatous micaceous and keratotic balanitis, bowenoid papulosis, lichen sclerosus et atrophicus and squamous cell carcinoma.[4] In our study 1 patient was diagnosed with genital lichen sclerosus et atrophicus, however we did not include this case in premalignant/malignant disease group. Lichen sclerosus et atrophicus is a chronic inflammatory dermatosis commonly predominantly presenting on anogenital area. Although, it is associated with an increased risk of squamous cell carcinoma of the penis, it is not considered as a premalignant condition by all authors.[18] The low prevalence of malignancies in our study, may be due to circumcision, which is associated with a decreased risk of penile carcinoma.[15]

Pruritus was the most common associated symptom in our study group. And it was most common in the inflammatory dermatoses subgroup. Clothing, friction, maceration, use of topical treatments, over washing, atopy may be contributing factors.[1] Other studies also reported itching in genitalia as a common symptom.[1,4,6,19-21] Patients in the infectious disease group were the youngest among all groups. Mons pubis was the most common localization in all subjects followed by corpus of the penis, scrotum, glans

penis, perianal area and perineum. In some studies evaluating nonvenereal genital dermatoses, penis was reported to be the most common involvement site, in some studies scrotum was reported as the common site of involvement.[1,4,6,19-21] Papules were the most prevalent lesion type, particularly in infectious and benign conditions, and most patients presented with a single lesion.

All the patients were screened for viral serology and 5 patients were positive for HBV infection, 4 for syphilis markers, 5 patients were HIV positive. All the HBV positive patients already had the diagnosis and were under follow-up in gastroenterelogy department. Four patients who were positive for syphilis were detected at the admission to our department. One of the HIV positive patients was presented with findings of syphilis and 2 of them presented with condyloma acuminata who already had the diagnosis of HIV positivity and were under follow-up in infectious disease department, while the other 1 had condyloma acuminata and one had skabies and HIV positivity was detected during dermatology examination. This finding emphasizes the cruciality of screening of STDs.

Notably, 51.8% of patients in the STD group were unaware that their disease was sexually transmitted, with 51.1% reporting a history of suspicious sexual contact. Many patients may underreport sexual histories due to stigma, underscoring the need for thorough patient education.

CONCLUSION

Infectious diseases were the most common category of male genital dermatoses in our study, with condyloma acuminata being the most prevalent condition. Given that condyloma acuminata is a sexually transmitted disease caused by HPV, it highlights the importance of public health interventions and preventive strategies. Circumcision has been suggested as a protective factor against HPV infection, reducing the incidence of genital warts and HPV-associated malignancies. However, despite all patients in our study being circumcised, condyloma acuminata remained the most common diagnosis, emphasizing the need for additional protective measures, such as HPV vaccination and safe sexual practices. Public health campaigns, condom use, regular screenings, and HPV vaccination should be promoted to reduce STD prevalence. Integrating STD education into dermatology consultations and community-based programs can enhance early detection and reduce stigma. Healthcare-based educational sessions, social media outreach, and targeted interventions for high-risk groups can further improve disease prevention. Since benign dermatoses do not cause symptoms and persist for a long time, patients may not consult a physician, which explains the low rates in our study. It should be noted that in male patients, genital skin diseases may cause anxiety and embarrassment, delaying the admission to the physician and diagnosis. In skin diseases, genital area examination should always be part of the whole skin examination. A clinical finding detected after the examination will allow early diagnosis, prevent progression and, in some cases, contribute to public health by reducing sexual transmission.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

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