

# Prevalence and risk factors of vulvar dermatoses: A hospital-based study

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## Abstract

**Background:** The overall prevalence of vulvar diseases in the literature is low because of underreporting and is often neglected; thus, its impact on a female's life is often underestimated. **Objectives:** This study is aimed to determine the prevalence of vulvar diseases and their associated risk factors in patients attending a tertiary care hospital. **Materials and Methods:** This is a descriptive, cross-sectional, and case-controlled study wherein all female patients attending the dermatology outpatient department (OPD) were screened for the signs and symptoms of vulvar dermatoses and were enrolled after obtaining informed consent and institutional ethics committee approval for 21 months. Out of them, 200 patients who consented and had signs and symptoms of vulvar diseases were selected as cases, and the same number of age-matched females were enrolled as controls with no signs and symptoms of vulvar dermatoses. **Results:** During the study period, 9431 females attended the dermatology OPD, of which the prevalence was 2.12% (200 patients). The most common infection was genital infection without sexually transmitted infection (57%) (tinea cruris [33.5%]), followed by inflammatory dermatoses (21%) (lichen sclerosus et atrophicus [6%]). The most common risk factor found statistically significant ( $P \leq 0.005$ ) were homemakers (49%) and the use of undergarments of mixed fabric (70.68%), followed by nonmenopausal females (63.15%). **Conclusion:** Our study findings indicated that the prevalence was low, which reflects the tip of an iceberg. Further clinical and population-based studies, a multidisciplinary approach including gynecological consult for diagnostic and therapeutic approach is needed for the optimal management of vulvar diseases.

**Key words:** Prevalence, risk factors, vulvar diseases

## Introduction

The vulva has been referred to as “the forgotten pelvic organ.”<sup>[1]</sup> Vulvar dermatoses are skin disorders that affect the vulva. They may be asymptomatic or may present with itching, burning, dyspareunia, pain, fissuring, sometimes bleeding after intercourse, and discomfort.<sup>[1]</sup> Its anatomical and physiological characteristics create additional diagnostic and therapeutic difficulties. The study of vulvar diseases is emerging as a new branch of dermatology. Many women are not examined and are misdiagnosed with “thrush.” Self-treatment with topical medications (steroid abuse) may delay accurate diagnosis and increase the risk of secondary irritant reactions. When the problem is thought to be in the anogenital skin, referral to a dermatologist or a vulvar clinic is appropriate.

The skin disorders of the genitalia can be grouped into the following categories:<sup>[2]</sup> (1) normal anatomical variants, (2) sexually transmitted infections (STIs) affect the genitals, (3) genital infections other than sexually transmitted diseases (STDs), (4) bullous dermatoses, (5) inflammatory conditions, (6) premalignant dermatoses, (7) malignant diseases of genitalia, and (8) others.

The incidence and prevalence of dermatoses affecting female genitalia and their etiopathogenesis are generally not well established. The prevalence is high in developing countries as compared to developed countries. Disease courses affecting other areas of the body are better

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**How to cite this article:** Mundhe AD, Jadhav A, Deo K, Deora MS, Gaikwad R, Shinde RC. Prevalence and risk factors of vulvar dermatoses: A hospital-based study. Indian J Sex Transm Dis 2022;43:30-4.

Submitted: 08-Dec-2021

Revised: 16-Mar-2022

Accepted: 08-Apr-2022

Published: 07-Jun-2022

## Access this article online

Quick Response Code:



Website:

www.ijstd.org

DOI:

10.4103/ijstd.ijstd\_108\_21

characterized, but the environment of the vulva strongly affects the course of the disease.

The purpose of the study was to investigate the magnitude of the frequency of vulvar diseases, their clinical patterns, and the risk factors associated with the enrolled patients.

#### Aims and objectives

This study aimed to study the prevalence of vulvar dermatoses, the different clinical patterns, and its associated risk factors.

#### Materials and Methods

The present study was carried out at the dermatology outpatient department (OPD) in tertiary care hospital after obtaining Institutional Ethical Clearance. It is a descriptive, cross-sectional, and case-controlled study carried out for 21 months. Cases and age-matched controls visiting the OPD were enrolled during the study duration. All newly registered female patients were screened for vulvar dermatoses, out of which 200 patients with vulvar dermatoses were taken as cases after counseling, who have not taken any prior treatment and obtaining informed written consent. Patients with vulvar dermatoses taking treatment before the visit and patients not consenting were excluded from the study. An equal number of age-matched females without vulvar lesions or symptoms were selected as controls. Detailed clinical examination, laboratory investigations such as complete blood count, blood sugar level, urine routine and microscopy, Gram staining, and KOH mount of the patients were done according to the case study proforma. The risk factors such as marital status, occupation, use of undergarments and detergent, menopause, and menstrual history were ruled out, investigated, and treated wherever needed.

Data analysis was performed using the SPSS (Statistical Package for the Social Sciences) software version 17 of Windows. Data were expressed in descriptive statistics. The duration and diagnosis of the disease were calculated with number and percentage. The *t*-test was applied to find whether the difference of age between cases and controls was significant. The Chi-square test was applied to find the association of age, marital status, occupation, type of detergent, type of undergarments, menopause, and menstrual history between both groups.  $P \leq 0.05$  was accepted as the level statistically significant.

#### Results

The prevalence of vulvar dermatoses (200 cases) is 2.12% [Figure 1]. The mean age of cases is 30.94 standard deviation  $\pm$  14.29 years which is not significant ( $P > 0.05$ ) [Table 1]. Married women, homemakers, use of mixed types of undergarments, and menopausal women were significantly at risk, but not significant with the use of detergent and menstrual history [Table 2]. Tinea cruris (67, 33.5%) is seen most frequently, followed by candidal vulvovaginitis (34, 17%) [Table 3]. There is a statistically significant ( $P < 0.05$ ) association between vulvar dermatoses and age with the largely affected group of 16 and 30 years with genital infections other than STD (67 cases), followed by STDs (20 cases) [Table 4].

#### Discussion

Although there are several reports on the study of individual vulvar disorders in the literature, there is a paucity of studies that have systematically studied the prevalence, associations, and risk factors of vulvar

dermatoses altogether. This study consists of a series of 200 cases of vulvar dermatoses out of 9431 female patients attending the OPD of a tertiary care center during the study period of 21 months.

The prevalence of vulvar diseases accounted for 2.12% of all dermatological disorders recorded among all the female patients [Figure 1]. It is comparable and similar to the findings of Pathak *et al.* reported 1.9%.<sup>[3]</sup>

The mean age of the patients was  $30.94 \pm 14.29$  years [Table 1] which is similar to the study by Gokdemir *et al.*<sup>[4]</sup>

There is a significant association of vulvar dermatoses with age wherein the maximum number of patients were from the age group of 16–30 years (42.5%), followed by 31–45 years (25.5%) which is similar to the study by Pathak *et al.*<sup>[3]</sup> This could be attributed to more sexual activity in these groups. The duration of lesions reported in maximum cases was  $<1$  month (69%).

On analysis of the demographic data of the patients including marital status and occupation, the majority of the patients were married (69%), among which maximum cases were homemakers (49%), followed by students (28.5%) [Table 2]. This is comparable to the study by Pathak *et al.*<sup>[3]</sup>

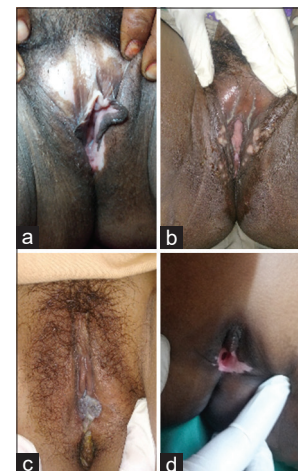
The majority of patients used detergent in the form of powder (52.5%) to wash the undergarments, which does not seem to contribute to vulvar dermatoses in our study [Table 2]. However, Pathak *et al.* have shown a significant association with the use of powder for washing undergarments.<sup>[3]</sup> Washing of undergarments with hypoallergenic soaps is recommended as anything that is irritant can lead to itching, soreness of the skin, and irritation.

Mixed-type fabric undergarments (70.68%) are commonly used, followed by cotton fabric (48.09%) which was significantly associated in both cases and controls [Table 2] which contrasts with the study by Pathak *et al.* where

**Table 1: Comparison of age**

Parameter	Controls		Cases		Z	P
	Mean	SD	Mean	SD		
Age (years)	28.42	15.13	30.94	14.29	1.71	0.088

SD=Standard deviation



**Figure 1:** (a) Lichen sclerosus et atrophicus (b) Herpes genitalis (c) Condyloma accuminata (d) Vitiligo

**Table 2: Risk factors associated with vulvar dermatoses**

Risk factors	Control, n (%)	Cases, n (%)	Total, n (%)	$\chi^2$	P
<b>Marital status</b>					
Married	104 (42.97)	138 (57.02)	242 (60.5)	12.09	0.001
Unmarried	96 (60.75)	62 (39.24)	158 (39.5)		
<b>Occupation</b>					
Student	80 (40)	57 (28.5)	137 (34.5)	16.24	0.001
Homemaker	62 (31)	98 (49)	160 (40)		
Working	41 (20.5)	38 (19)	79 (19.75)		
Not applicable	17 (8.5)	7 (3.5)	24 (6)		
<b>Type of detergent</b>					
Soap	90 (45)	95 (47.5)	185 (46.25)	0.25	0.62
Powder	110 (55)	105 (52.5)	215 (53.75)		
<b>Undergarment material</b>					
Nylon	35 (57.37)	26 (42.62)	61 (15.25)	12.96	0.005
Cotton	136 (51.9)	126 (48.09)	262 (65.5)		
Mix	17 (29.31)	41 (70.68)	58 (14.5)		
Do not use	12 (63.15)	7 (36.84)	19 (4.75)		
<b>Menopause</b>					
Absent	14 (36.84)	24 (63.15)	38 (9.5)	13.62	0.001
Present	143 (47.5)	158 (52.49)	301 (75.25)		
Not applicable	43 (70.49)	18 (29.5)	61 (15.25)		
<b>Menstrual history</b>					
Regular	111 (46.63)	127 (53.6)	238 (59.5)	3.64	0.16
Irregular	31 (50)	31 (50)	62 (15.5)		
Not applicable	58 (58)	42 (42)	100 (25)		

nylon undergarments were a major contributing factor for vulvar dermatoses.<sup>[3]</sup> The use of the mixed or polyester type of undergarments causes sweat, moisture, and humidity retention by trapping moisture and air between the skin and the fabric, creating a favorable environment for organisms such as bacteria and fungi to thrive which may result in urinary tract infection, bacterial, and fungal skin infections. Furthermore, tight undergarments can potentially cause slow blood circulation.

The correlation between menopause and vulvar dermatoses has not been explored. In this study, a statistically significant difference was observed between menopausal and nonmenopausal females [Table 2]. Menstruating females were found to have a significantly higher incidence due to improper hygiene practices, use of sanitary napkins for a long duration, and sexual activity. Menstrual irregularity was not found to be a significant contributing factor in causing vulvar dermatoses in our study which contrasts with the study by Pathak *et al.*, where it was found significant.<sup>[3]</sup> Family history was found to be contributory in our study. This could be due to poor hygiene, overcrowding, and sharing of towels and clothes among each other.

The most common causes of vulvar dermatoses were genital infections other than STD (57%) [Table 3] found in our study. These findings were similar to studies by Pathak *et al.* and Bauer *et al.*, where fungal and bacterial infections were observed frequently.<sup>[3,5]</sup>

The most common infection in our study was tinea cruris (33.5%), followed by candidal vulvovaginitis (17%) which contrasts with the study by Buscemi *et al.* and Patel *et al.* where candidal vulvovaginitis (11.4%) was more prevalent. However, in the study by Sullivan *et al.*, lichen sclerosus et atrophicus (LSetA) (26%) was the most

**Table 3: Distribution of cases (n=200)**

Type	Diagnosis	Cases, n (%)
<b>Infections (141; 70.5%)</b>		
<b>STD (13.5%)</b>		
	Molluscum contagiosum	8 (4)
	Phthirus pubis	1 (0.5)
	Chancroid	3 (1.5)
	Genital wart (condyloma acuminata)	5 (2.5)
	Herpes genitalis	10 (5)
<b>Genital infections other than STD (57%)</b>		
	Tinea cruris	67 (33.5)
	Candidal vulvovaginitis	34 (17)
	Superficial folliculitis	9 (4.5)
	Deep folliculitis	3 (1.5)
	Varicella	1 (0.5)
<b>Inflammatory lesions (42; 21%)</b>		
<b>Bullous disorders (2.5%)</b>		
	Pemphigus vulgaris	2 (1)
	Erythema multiforme	1 (0.5)
	Fixed drug eruption	2 (1)
<b>Inflammatory lesions (18.5%)</b>		
	LSetA	12 (6)
	LP	6 (3)
	Behcet's disease	1 (0.5)
	Psoriasis	4 (2)
	ICD	1 (0.5)
	LSC	5 (2.5)
	Vitiligo	3 (1.5)
	Atrophic vulvovaginitis	5 (2.5)
<b>Others (17; 8.5%)</b>		
<b>Others</b>		
	Acrochordon	4 (2)
	Pruritus vulvae	13 (6.5)

LSetA=Lichen sclerosus et atrophicus; LP=Lichen planus; ICD=Irritant contact dermatitis; LSC=Lichen simplex chronicus; STD=Sexually transmitted disease

common, followed by candidal vulvovaginitis (16%), while Puri *et al.* reported 31% of candidal vulvovaginitis.<sup>[6-9]</sup>

The second most common condition observed was bacterial infections wherein superficial folliculitis (4.5%) followed by deep folliculitis (1.5%) was seen in this study which was almost similar to the study by Pathak *et al.* (5.7%).<sup>[3]</sup>

Among viral infections, varicella was seen in 0.5%, in contrast to Pathak *et al.*, who reported 1.9% of the same.<sup>[3]</sup>

STDs were reported in 27 (13.5%) cases, among which herpes genitalis (10, 5%) was found to be commonly, followed by molluscum contagiosum (84%), condyloma acuminata (5, 2.5%), chancroid (3, 1.5%), and phthiriasis pubis (1, 0.5%) among the cases in our study. Whereas in the study by Pathak *et al.*, condyloma acuminata (7.6%) was seen commonly, followed by herpes genitalis (0.9%).<sup>[3]</sup> Koutsky *et al.* reported 1% of sexually active females (age 15–49) with condyloma acuminata and 1.5% was reported by Fischer and Rogers.<sup>[10,11]</sup> Molluscum contagiosum was reported by Fischer and Rogers in 0.7%, Singh *et al.* in 0.8% cases, and Priya *et al.* reported 5.7%.<sup>[11-13]</sup> Phthiriasis pubis was reported by Bignell in 2% and Hart reported 1.1% in their studies.<sup>[14,15]</sup>

Among the inflammatory conditions, LSetA (6%) was more prevalent, followed by lichen simplex chronicus (LSC) (2.5%) which is almost similar to the study by Pathak *et al.* where LSetA (2.9%) and LSC (0.9%) were reported.<sup>[3]</sup> This was in contrast with a study by Sullivan *et al.* wherein they reported LSetA

**Table 4: Association between vulvar dermatoses and age**

Vulvar dermatosis	Age (years)					Total, n (%)
	0-15, n (%)	16-30, n (%)	31-45, n (%)	46-60, n (%)	>60, n (%)	
STD	1 (3.7)	20 (74)	6 (22.2)	0	0	27
Genital infections other than STD	12 (10.5)	67 (58.7)	26 (22.8)	7 (6.1)	2 (1.7)	114
Bullous disorders	0	2 (40)	2 (40)	1 (20)	0	5
Inflammatory lesions	4 (10.8)	7 (18.9)	13 (35.1)	8 (21.6)	5 (13.5)	37
Others	1 (5.8)	4 (23.5)	6 (35.2)	4 (23.5)	2 (11.7)	17

$\chi^2=44.10$ ,  $P<0.0001$ . STD=Sexually transmitted disease

in 26% of cases, Fischer and Rogers reported 17%, and Cheung *et al.* reported 21%.<sup>[8,11,16]</sup>

Atrophic vulvovaginitis was observed in 2.5% of cases belonging to age groups 16–30 and 31–45 years compared to 1.9% in a previous study by Pathak *et al.*, whereas it was observed in 40% of cases by Tobin and Harindra who has carried out the study in female aged 50 years and above.<sup>[3,17]</sup>

Vulvar psoriasis is a very rare inflammatory condition, and in this study, it was seen in four cases (2%) not exclusively on the vulva as other cutaneous areas were also involved. The study by Pathak *et al.* showed 1.9%, whereas similar results were reported by Fischer and Rogers showed 12%, Hammock and Barrett which showed 2%, Heller *et al.* showed 1.8%, and Fischer and Rogers showed 5%.<sup>[3,11,18-20]</sup>

Exclusive vulvar lichen planus was seen in 3% of cases without dermatological involvement. Lewis *et al.* reported 51% of cases as a part of generalized lichen planus.<sup>[21]</sup>

In this study, vitiligo was seen in 1.5%, whereas Pathak *et al.* reported 5.7% and Fischer and Rogers reported 0.7% cases.<sup>[3,11]</sup>

In this study, irritant contact dermatitis (ICD) was reported in 0.5% of cases, whereas a study by Singh *et al.* reported 1.6% of cases.<sup>[12]</sup> Agents usually responsible for irritant dermatitis include cleansing agents, depilatory creams, disinfectants, sanitary napkins, latex condoms, perfumed products, deodorants, and medicaments.<sup>[22]</sup> It usually occurs because of an impairment of the barrier function which may occur due to dampness and maceration secondary to a heavy vaginal discharge or increased contact with urine in an incontinent patient.<sup>[23,24]</sup> ICD occurs more frequently than allergic contact dermatitis.<sup>[25]</sup>

Among the bullous disorders pemphigus vulgaris and fixed drug eruptions, 1% each were seen in our study but not exclusively on the vulva as other cutaneous areas were also involved which is almost similar to the findings of Pathak *et al.* (0.9%).<sup>[3]</sup> Furthermore, erythema multiforme was reported in 0.5% of cases.

Vulvar acrochordons were seen in 2% of cases, whereas Singh *et al.* reported in 1.6% and Priya *et al.* reported 2.8% cases and Puri and Puri reported in 5% of cases.<sup>[12,13,26]</sup>

Finally, pruritus vulvae are a common symptom with a multifactorial origin which often significantly impairs the patient's quality of life, impacting sexual function, relationships, sleep, and self-esteem. In our study, pruritus vulvae not associated with any particular dermatoses were observed in 6.5% of the cases, which was in contrast to the previous study by Pathak *et al.* who reported 36.2% of the cases where psychological, social, behavioral, and sexual factors were seen to influence the prevalence of the condition.<sup>[3]</sup> Other studies by Gokdemir *et al.* reported 26.5% of cases and Paek *et al.* reported 75%.<sup>[4,27]</sup>

Thus, this study indicates that infectious conditions predominate over inflammatory ones in developing countries such as India while the opposite is observed in developed countries. Hence also, age is an important determinant in the occurrence of various conditions. Younger females are more affected by infections and menopausal women present with inflammatory conditions. This can be mitigated by imparting sex education and good hygienical practices to high school girls. While we did not encounter any malignant conditions, but frequent screening of menopausal women should be undertaken because long-standing inflammatory conditions can predispose them to malignancy.

However, since pregnant females, females taking prior treatment and use of over-the-counter drugs, and those who have not consented were excluded large population-based studies are required to estimate the exact impact on the female population.

## Conclusion

The prevalence of vulvar dermatoses in this study was 2.12% which only reflects the tip of an iceberg of the actual patients who suffer from similar problems. The most common vulvar dermatoses in this study were of infections in which the dermatophytosis was the most frequent to occur with the predominance of tinea cruris. Although the married population, homemakers, use of mixed fabric undergarments, menopause, and family history were found to be significant with an increased incidence of vulvar dermatoses, in reality, it is difficult to establish in such a small study.

Multidisciplinary specialty clinics including gynecological consultation should be made available for a diagnostic and therapeutic approach that will cover all the vulvar dermatoses. Increasing awareness among the female population and encouraging them to seek treatment for the diseases and avoid self-medication is of paramount importance.

Our study findings indicate that the known frequency of vulvar dermatoses represents only a small proportion of the actual affected population. Further clinical and large population-based research study is a need concerning the treatment, follow-up, and true prevalence of these diseases in the community.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

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