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Profile of Antimicrobial Resistance and Sensitivity in Vulvar Abscesses in Women Attending a Tertiary Hospital

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ABSTRACT

***Context**: Vulvar abscess is a highly prevalent pathology in patients seeking emergency care; however, its epidemiology has yet to be fully clarified.*

***Aims:** This study aimed to determine possible risk factors, the most common microorganisms involved and the appropriate antibiotic therapy in cases of vulvar abscesses treated in a tertiary hospital.*

***Settings and Design:** This prospective study included 51 women who presented with a vulvar abscess and sought medical help at the hospital's gynaecological emergency room over a 70-week period.*

***Methods:** Drainage of the abscess and microbiological analysis allowed the pathogen responsible for the lesion to be identified, as well as the profile of antimicrobial sensitivity and resistance to be determined.*

***Statistical analysis**: Frequencies and percentages, as well as means, medians and standard deviations, were calculated. Associations between the study variables were determined using the chi-square test or Fisher's exact test.*

***Results:** Overall, 52.94% of the cultures were positive for methicillin-resistant Staphylococcus aureus (MRSA). There was no significant difference in age between the patients infected with MRSA and those infected with other agents ($p>0.05$). The MRSA isolates were sensitive to sulfamethoxazole + trimethoprim and to gentamicin, as were the great majority of the other pathogens. Shaving the vulvar region was the most important risk factor, being present in 74.5% of cases.*

***Conclusion**: MRSA is highly prevalent and a major cause of vulvar abscesses. Therefore, in these cases, an antibiotic therapy regimen with coverage for MRSA, such as sulfamethoxazole-trimethoprim, should be initiated as soon as possible.*

Keywords

Abscess, Methicillin-resistant, *Staphylococcus aureus,* Vulva.

Key Message

In cases of vulvar abscesses, methicillin-resistant *Staphylococcus aureus* (MRSA) is highly prevalent, irrespective of the woman's age. The most common risk factor for infection is shaving the vulvar region. Early therapeutic intervention should necessarily include an antibiotic therapy regimen with coverage for MRSA, such as sulfamethoxazole-trimethoprim.

Introduction

The term vulva refers to the entire external female genitalia, including the mons pubis, labia majora and minora, clitoris, the vestibule of the vagina, the vestibular bulbs, greater vestibular (Bartholin's) glands, Skene's glands and the urethral meatus [1]. A vulvar abscess develops when purulent material collects in any of these structures, normally resulting from infected sebaceous glands [2,3], but also from other skin structures such as hair follicles and sweat glands [3].

The close anatomical relationship between Camper's fascia, or the superficial fascia of the vulva, and the internal superficial fascia in the thigh and the anterior abdominal wall facilitates the rapid dissemination of vulvar infections to these structures [3,4]. Consequently, accurate diagnosis and timely treatment are crucial in order to avoid mass dissemination of the infection and systemic involvement [4].

Clinically, vulvar abscesses are characterized by the presence of swelling in the vulvar region together with localized warmth, erythema, sensitivity and, occasionally, fever. A fluctuating point in the middle of the swelling/lump is common, with or without spontaneous drainage of the purulent secretion [4].

The susceptibility of the vulvar region to infection is principally due to the use of depilation methods such as wax, razors and tweezers, which cause trauma to the hair follicle, leading to infectious or merely mechanical folliculitis. Microtrauma to the skin also tends to spread the infection locally, facilitating the inoculation of the pathogen and the mechanical propagation of the infection throughout the entire pubic region [3]. Sharing personal hygiene items such as bars of soap, razors and towels, as well as poor habits of feminine hygiene, are known risk factors for the appearance of a vulvar abscess [5]. Other factors that affect its physiopathology and morbidity include diabetes mellitus, obesity, immunosuppression, pregnancy and local trauma [4].

Pathogens commonly associated with this type of inoculation are *Staphylococcus aureus*, *Streptococcus pyogenes*, *Pseudomonas aeruginosa* and *Escherichia coli* [6,7]. Today, methicillin-resistant *Staphylococcus aureus* (MRSA) accounts for the majority of cases of these infections of the skin and soft tissues [6,8].

Material and Methods

This was a prospective study involving patients diagnosed with a vulvar abscess over a 70-week period. Inclusion criteria consisted of having had the abscess lesion drained and a culture-positive specimen. Specific cases of abscesses of the Bartholin or Skene glands, to be evaluated in a future study, were excluded from the present study. Individual data were collected from each patient using a structured questionnaire that included but was not limited to the following variables: age, use of razors in the vulvar region, and a prior diagnosis of diabetes mellitus.

The institutional internal review board approved the study protocol under reference 4.167.397. All the participants voluntarily agreed to participate and provided written informed consent.

Abscess specimens were collected in the operating room under local anaesthesia and sedation. A scalpel was used to drain the abscess and the purulent specimen was aspirated using a disposable syringe. The microbiology laboratory prepared cultures using brain heart infusion broth for nutrition and growth and blood agar plates. After a mean period of 72 hours, the pathogen was identified and its antimicrobial sensitivity and resistance profile was determined. The microbiology results were retrieved from the hospital's electronic medical records database.

The data were entered on an Excel spreadsheet and analysed using SPSS, version 26. Frequencies and percentages were calculated for the categorical variables, and means, medians and standard deviations were used to analyse the numerical variables. Possible associations between the study variables were determined using the chi-square test, or alternately, whenever some cells had an expected value of less than 5, Fisher's exact test was used.

The Kolmogorov-Smirnov test was used to verify the normality of the variable *age*. Since distribution was normal, Student's t-test was used to compare age between patients with positive MRSA cultures and those with cultures positive for "*other pathogens*." Equality of variances was established using Levene's test. Associations and comparisons were considered statistically significant when p-values were <0.05.

Results

The 51 patients analysed in the present study ranged in age from 2 to 66 years, with a mean age of 28 years (Table 1). Overall, 42.2% of the patients were between 20 and 34 years of age. No statistically significant difference in age ($p>0.05$ Student's t-test) was found between patients infected with MRSA and those infected with other agents.

Table 1: Age of the participants in the study sample.

Age (in years)	Frequency	Percentage
2-9	12	23.52
20-29	20	39.21
32-39	9	17.64
43-49	4	7.84
52-66	6	11.76
Total	**51**	**100.0**

Overall, 74.5% of the patients diagnosed with a vulvar abscess reported having recently used razors on the vulvar region, while the remaining 25.4% reported not having used this depilation method. Diabetes mellitus was present in 7.8% of the patients. No association was found between the use of razors or the presence of diabetes and infection by MRSA ($p>0.05$).

Positive MRSA cultures were found in 52.94% (27/51) of the patients (Table 2). The sensitivity of this microorganism to sulfamethoxazole + trimethoprim and to gentamycin was 100%, while sensitivity to linezolid was 96.29%, to clindamycin 88.88% and to vancomycin 74.07% (Table 3). In the remaining cases, the pathogens isolated included *S. aureus* (11.8%), *E. coli* (9.8%) and *Proteus mirabilis* (5.9%).

Table 2: Distribution of the bacterial pathogens identified in cultured vulvar abscesses.

Culture	Frequency	Percentage
MRSA	26	50.98
S. aureus	6	11.8
E. coli	5	9.8
Proteus mirabilis	3	5.9
Streptococcus agalactiae	2	3.9
Streptococcus pneumoniae	2	3.9
Streptococcus spp.	2	3.9
Acinetobacter baumannii complex	1	2.0
E. Coli + multi-sensitive *Klebsiella pneumoniae*	1	2.0
Enterococcus faecalis	1	2.0
Pseudomonas aeruginosa	1	2.0
MRSA+ multi-sensitive *E. coli*	1	2.0
Total	**51**	**100.0**

MRSA: methicillin-resistant *Staphylococcus aureus.*

Table 3: Sensitivity profile of methicillin-resistant *Staphylococcus aureus* (MRSA).

Sensitive to:	MRSA	
	n	%
Sulfamethoxazole-Trimethoprim	27	100
Gentamicin	27	100
Linezolid	26	96.29
Clindamycin	24	88.88
Vancomycin	20	74.07
Tetracycline	16	59.25

Overall, the profile of antimicrobial resistance in all cultures was 52.9% for erythromycin and oxacillin, 39.2% for cephalothin and 33.3% for ciprofloxacin. When the antimicrobial resistance of MRSA alone was evaluated, results showed 100% resistance for oxacillin, 88.8% for erythromycin, and 55.55% for cephalothin and ciprofloxacin (Table 4).

Table 4: Resistance profile in positive methicillin-resistant *Staphylococcus aureus* (MRSA) cultures.

Resistance	MRSA cultures	
	n	%
Oxacillin	27	100
Erythromycin	24	88.88
Ciprofloxacin	15	55.55
Cephalothin	15	55.55

Discussion

The present findings on age are comparable with those reported by Thurman et al. [9], who found that a mean age of 31.31 and 32.3 years was associated with women (n=126) who had vulvar abscesses due to MRSA and non-MRSA infections, respectively. The fact that MRSA was the most commonly found pathogen in the specimens collected here (52.94% of the women) corroborates previous findings in which MRSA was the principal pathogen involved in skin infections, as is the case of vulvar abscesses [6,10].

Although a previous study [9] reported wax depilation and sharing of personal hygiene products (bars of soap and razors) as risk factors for increased patient susceptibility to community-acquired MRSA infection, no statistically significant correlation with these factors was found here.

In a sample of 133 cultured vulvar abscesses, Thurman et al. [9] found that 64% were positive for MRSA. The sensitivity of the MRSA isolates was 96% for sulfamethoxazole + trimethoprim and 72% for clindamycin. Likewise, in the present study 52.94% of cultures were positive for MRSA, with 100% of these microorganisms being sensitive to sulfamethoxazole + trimethoprim and 88.88% to clindamycin.

Balistreri et al. [11] reported that vulvar abscess pathogens were sensitive to various antimicrobial agents, mainly sulfamethoxazole, beta-lactams and aminoglycosides. Accordingly, the antimicrobial profile found in the present study showed sensitivity of 84.3% for gentamycin and 76.5% for sulfamethoxazole + trimethoprim. On the other hand, it was found that in general, 52.9% of these positive cultures, irrespective of the infectious agent, were resistant to oxacillin, which belongs to the class of beta-lactams.

Despite this striking evidence, a search of the literature revealed that few studies have been conducted on the subject. This fact highlights a need for further research to improve understanding and clarify the profile of resistance and antimicrobial sensitivity of vulvar abscesses in different geographical regions and/or specific healthcare centres, allowing the optimal treatment and approach to be defined.

Conclusion

MRSA was the most common organism detected in this sample of women with vulvar abscesses. Although community-acquired MRSA is highly pathogenic, all the cases of MRSA isolated in this study were sensitive to sulfamethoxazole-trimethoprim. The high prevalence of MRSA makes this pathogen a strong possibility when trying to identify the causative agent in cases of vulvar abscess. A regimen of antibiotics active against this infectious agent, such as sulfamethoxazole-trimethoprim, should be initiated as early as possible in cases of vulvar abscesses. Indeed, in addition to being inexpensive, these drugs are also effective against other microorganisms commonly isolated in the vulva such as *Proteus*, *E. coli* and Group B streptococcus.

Despite the high prevalence of MRSA, data on vulvar abscesses are, in general, scarce in the literature. Clarification is required, particularly with respect to the pathogenicity of the disease and the accurate prevalence of MRSA. Training in clinical reasoning and providing early treatment in accordance with the profile of antimicrobial response are crucial in controlling this condition.

Ethics

The present report was submitted to the internal review board of the Escola Superior de Ciências of the Santa Casa de Misericórdia

de Vitória (EMESCAM) and approved under reference number 4.167.397 (CAAE: 34376620.4.0000.5065). Written informed consent for publication was obtained from the patient.

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References

1. Netter FH. Atlas of human anatomy. Philadelphia, Elsevier. 2018.
2. Bora SA, Condous G. Bartholin's, vulval and perineal abscesses. Best Pract Res Clin Obstet Gynaecol. 2009; 23: 661-666.
3. Lazenby GB, Thurman AR, Soper DE. Vulvar abscess. UpToDate. 2022.
4. Wood SC. Clinical manifestations and therapeutic management of vulvar cellulitis and abscess: methicillin-resistant Staphylococcus aureus, necrotizing fasciitis, Bartholin abscess, Crohn disease of the vulva, hidradenitis suppurativa. Clin Obstet Gynecol. 2015; 58: 503-511.
5. Trager JD. Pubic hair removal: pearls and pitfalls. J Pediatr Adolesc Gynecol. 2006; 19: 117-123.
6. Gorwitz RJ. A review of community-associated methicillin-resistant Staphylococcus aureus skin and soft tissue infections. Pediatr Infect Dis J. 2008; 27: 1-7.
7. Yang ES, Tan J, Eells S, et al. Body site colonization in patients with community-associated methicillin-resistant Staphylococcus aureus and other types of S. aureus skin infections. Clin Microbiol Infect. 2010; 16: 425-431.
8. Moran GJ, Krishnadasan A, Gorwitz RJ, et al. Methicillin-resistant S. aureus infections among patients in the emergency department. N Engl J Med. 2006; 355: 666-674.
9. Thurman AR, Satterfield TM, Soper DE. Methicillin-resistant Staphylococcus aureus as a common cause of vulvar abscesses. Obstet Gynecol. 2008; 112: 538-544.
10. Kim TH, Seap B, Kim S, et al. Vulvar abscess caused by methicillin-resistant Staphylococcus aureus (MRSA) in a postmenopausal woman. J Menopausal Med. 2016; 22: 118-121.
11. Balistreri M, Hagedorn J, Stitely ML. Vulvar abscess: a retrospective review. W V Med J. 2010; 106: 24-26.