

## Original Research Article

# Aetiology of vaginal discharge in children

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Received: 17 January 2017

Accepted: 07 February 2017

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## ABSTRACT

**Background:** Vaginal discharge [VD] is the most common gynecologic complaint in children. The causes vary from being physiological to sexually transmitted diseases. The anatomy and physiology of the vulva and vagina and the vaginal flora influence the causes to some extent. As the above factors vary as the child grows, the etiology varies too. At any age, VD is responsible for a significant morbidity. Hence enumerating the causes and identifying the common causes in specific age groups will help in development of preventive measures and early appropriate treatment. The aim of the study was to enumerate the cause of VD in children attending the OPD at Government Royapettah Hospital and to find out the causes of VD in specific age groups less than 2 year, 2-9 years and 9-14 years.

**Methods:** A retrospective analysis of twenty girls less than 14 years of age with VD details were collected from the STI cards of twenty children in the age group upto 14 years, with vaginal discharge, who attended the STI clinic at GRH, KMC will be selected and their symptoms, clinical examination findings, results of relevant investigations noted from their hospital records. Children with HIV infection, immunosuppression due to juvenile diabetes mellitus/ malignancy and history of sexual abuse will be excluded. The results tabulated and a descriptive analysis done to find out the most common aetiology in different age groups in children. Descriptive analysis was applied to analyse the results.

**Results:** Out of the twenty children studied 40, 10, 50 percent of the girls were in group A, B and C respectively. Youngest child was 6 months old and oldest was 14 years. In 10% of girls the incidence of VD was physiological and in 90% it was due to pathological causes. In 50% of children the causative agent could be demonstrated by laboratory investigations. Candida was the commonest agent demonstrated in 25% of girls studied. In 35% cases the cause was unidentifiable. Bacterial, parasitic and dermatological causes constituted to 10%, 15%, 10% of aetiology of VD respectively. In one child [5%] who had genital psoriasis, the clinical features of candidal infection was negative.

**Conclusions:** Aetiological diagnosis was very important in children with VD. Not all VD in children are infective and hence anti-fungal and anti-bacterial agents should not be prescribed without adequate clinical and or microbiological evidence. Pin worm infestation should be considered as a cause of VD in girls with perianal excoriation and nocturnal worsening of symptoms.

**Keywords:** Vaginal discharge, Children, Prepubertal

## INTRODUCTION

VD is the most common gynaecological complaint in children and vulvo-vaginitis is the most common cause for it. VD in children is a frequent cause for referral to

higher medical care. VD in prepubertal girls can be recurrent which warrants special attention.

In order to understand the aetiopathogenesis, it is important to understand the anatomy of children in different age groups. In the new born the appearance of

female genitalia is primarily due to the effects of maternal estrogen. The labia majora are full and labia minora appear thick. The vaginal mucosa is moist and appears pink. The hymenal folds are thick and redundant. As the child grows and the maternal estrogen ceases, the labia majora lose their fullness while the labia minora and hymen become thin and the vaginal mucosa becomes relatively atrophic. During puberty due to the ovarian estrogen the labia majora, labia minora, vaginal mucosa and hymen thicken. At the same time the clitoris enlarges and the urethra becomes more prominent. The various anatomical factors that place the vagina in close proximity with the rectum in children, the physiology of the immature vaginal epithelium and personal hygiene place the children at an increased risk of vulvovaginitis. Hence the aetiology of VD varies with age as the child grows. The commonest cause of VD is vulvovaginitis. Sexual abuse, foreign body, labial adhesion and vaginal agenesis are other important cause for VD.<sup>1</sup> In children with recurrent, persistent and blood stained VD sexual abuse must be considered.<sup>2</sup> In this study we have identified the causes of VD in 20 children with vaginal discharge.

The study was conducted with the aim to find out the etiology and possible predisposing factors of VD in 20 girls with history, clinical examination and relevant investigations.

## METHODS

This retrospective study included Children with history of VD referred to the out-patient department of the STI clinic, Government Royapettah Hospital, Kilpauk Medical College, Chennai. Institutional ethical committee clearance was obtained. The period of study was one year from January 2016 – December 2016.

Twenty girls up to 14 years of age, with vaginal discharge, who attended the STI clinic at GRH, KMC were selected and their symptoms, clinical examination findings, results of relevant investigations were noted from their hospital records. Children with systemic illness, HIV infection and immunosuppression due to juvenile diabetes mellitus/ malignancy were excluded. The following history taken were noted from the record:

- History of urinary symptoms like frequent micturition, crying while micturition, burning micturition, history of nocturnal perianal itching, history of recent upper respiratory infection or any skin infection, history of foul smelling discharge or bleeding per vaginum, any history of use of harsh antiseptics to clean the undergarments or the vulva, history of pre-existing skin diseases, history of prolonged antibiotic use, immune-suppressive drugs like steroids, history of any foreign body insertion were noted.
- Other history pertaining to genital hygiene like use of synthetic and tight fitting under garments, not using

undergarments when the children sit on the ground, frequency of diaper change in infants, drying after washing, routine de-worming was also noted.

- History of treatment for any other major illness was noted.

Clinical findings noted in the record, like presence of erythema, oedema of the introitus, nature of the discharge, presence of any co-existing skin diseases were noted. Excoriation marks in perianal and perineal region was noted. The results of saline and KOH mount and vaginal swab culture results were noted. In children with significant nocturnal perianal itching, the results of a motion ova and cyst examination and early morning tape stripping for eggs were noted. All children were screened for HIV and syphilis using serologic tests and those who were positive were excluded.

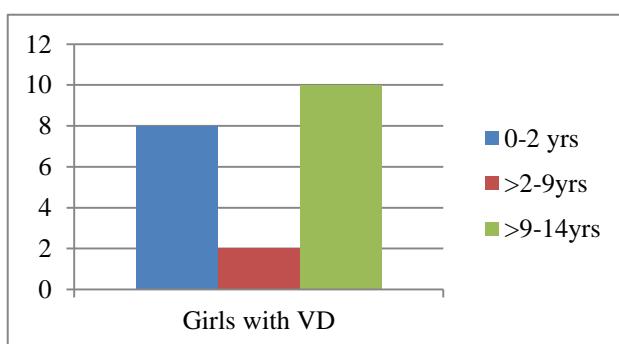
The data collected were computed in excel form, categorised age wise and cause wise. All the 20 children were categorised into three groups depending on the estrogen influence in the vaginal epithelium as follows: up to 2 years [A]; 2-9 years [B]; and above 9 years [C]. The causes were divided mainly into physiological and pathological. Pathological causes were further categorised as those due to Infections, infestations and dermatological conditions.

## Statistical analysis

Descriptive statistical analysis was done.

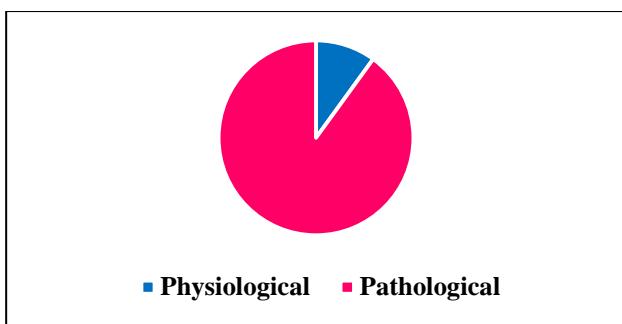
## RESULTS

The youngest child in our study was 6 months old. The mean age was 7.54 years and the median was 9 years. Out of the 20 children studied, 40% of the girls were in group A, whereas only 10% of children were seen in group B. The pre-pubertal and pubertal girls [group C] constituted to half of the children studied as given in Figure 1.



**Figure 1: Age wise distribution of girls with vaginal discharge.**

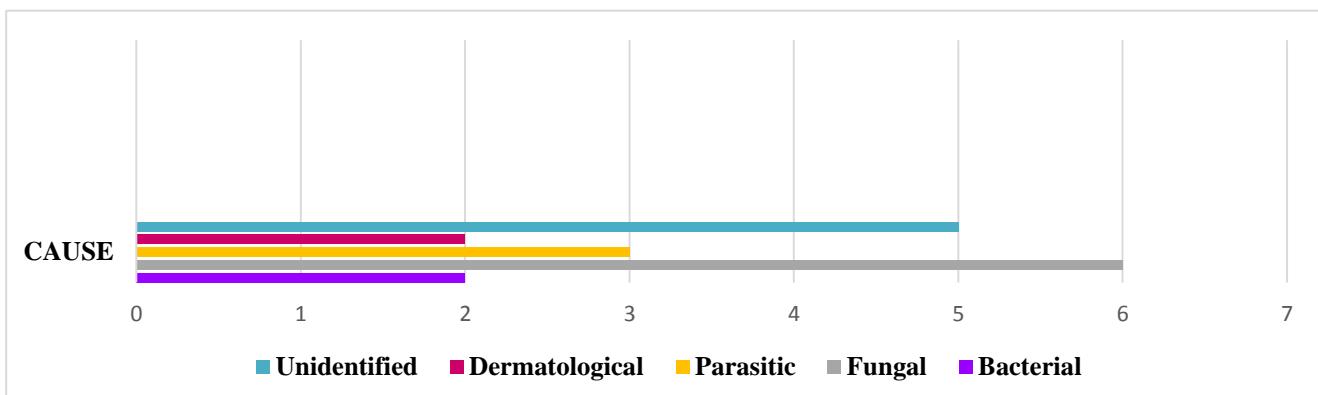
Physiological VD was noted in two of the pre-pubertal children as presented in Figure 2 the remaining 18 [90%] had pathological cause for the discharge.



**Figure 2: Aetiological causes for VD in children.**

**Table 1: Aetiological infective agents in children with identifiable causes of vaginal discharge.**

No	Age Year/Month	Investigations done		
		KOH Mount	Stripping	Culture
1.	10 years		Pin worm	
2.	8 years		Pin worm	
3.	14 years		Pin worm	
4.	1 year	Fungal hyphae		
5.	14 years	Fungal hyphae		
6.	6 months	Fungal hyphae		
7.	9 months			β-haemolytic streptococci
8.	13 years	Fungal hyphae		
9.	2 years	Fungal hyphae		
10.	2 Years			β-haemolytic streptococci



**Figure 3: Pathological causes for VD in girls.**

Out of the six children who had clinical features of candidal vulvovaginitis, one child had genital psoriasis as well. In this child hyphae could not be demonstrated which might be attributed to the topical steroid therapy given for psoriasis leading to transient suppression of fungal growth. Among the dermatological diseases, lichen sclerosus and contact dermatitis to diaper was observed in one each. Candida was the most common cause for VD in this study as seen in Figure 3. In five girls no organism could be demonstrated.

## DISCUSSION

VD in children is not uncommon. It has been found to be the commonest gynaecologic complaint in girls and the

Out of these 18 children with pathological VD, only 10 had an identifiable cause on investigation. In the remaining 8 no pathologic organism could be isolated. Out of the 10 with an identifiable cause, 5 children had fungal pseudo hyphae and budding yeast cells on KOH mount. Budding yeast cells were seen on gram stain as well. Three girls had pin worm infestation which was demonstrable with tape method and 2 had beta haemolytic streptococci grown on culture as shown in Table 1. The details of the aetiological agents in children with an identifiable cause are listed in Table 1.

most common reason for referral of pre-pubertal girl to gynaecologists. VD can be a source of distress for the girl, care giver and the health provider alike. The low estrogen levels in girls predispose the vaginal epithelium to infection. VD in children is different from that seen in adults. A thorough knowledge and awareness will help the physician / paediatrician/ dermatologist to effectively treat these girls without the need for unnecessary referrals.

VD can be physiological or pathological in children. Mucoid often bloody VD in the first fourteen days of life and milky white or clear mucoid discharge in prepubertal age are considered physiological. Any VD other than these should be viewed as pathological. The following

features will to some extent help suspect the cause of VD in young girls. Thick, white, cheesy – candidal; brownish and malodorous- foreign body induced; whitish grey with fishy odour- bacterial vaginosis; mucopurulant sometimes bloody- Shigella; purulent thick yellow – gonorrhoea; frothy watery yellow - trichomoniasis; and colourless discharge – pinworm infestation.

In our study children less than 2 years and above 9 years of age formed 90% of the study group. This is more or less corresponding to the age group where the influence of estrogen is still present. More than 80% of the girls were symptomatic, the main symptom being pruritus. Soreness was a major complaint in few children with bacterial cause and those in whom aetiological agent could not be demonstrated which is in line with the reported literature was redness and soreness was the main symptoms.

According to literature, though there is an overlap between vaginal flora isolated in children with VD and in asymptomatic healthy controls, it was found that *Streptococcus viridans*, *coagulase negative Staphylococci* and mixed anaerobes were commonly isolated from normal controls and *Staph aureus* and group A *Streptococci* were common in children with VD.<sup>3</sup> In the study by Kim et al, more than 80% were cases of nonspecific vulvo vaginitis without any growth in culture.<sup>4</sup> In our study we were able to demonstrate the causative agent in 50% of girls. The rate of nonspecific vulvo vaginitis according to literature may vary from 25-75%.<sup>5</sup> In our study it was about 35% inclusive of the physiologic cause in two of them.

A study by Bumbuliene et al in 115 pre-pubertal children showed that all children with vaginal discharge had predominant pathologic bacterial growth such as *Escherichia coli*, *Enterococcus faecalis*, *Staphylococcus coagulase negative*, *Streptococcus α haemolyticus* and A group *Streptococcus β haemolyticus*.<sup>6</sup> In a study by Yilmaz et al, pre-pubertal children had a predominant growth of β haemolytic *Streptococci*. We were able to demonstrate beta haemolytic *Streptococci* in only two of the subjects studied which is more or less similar to the observation made by others.<sup>7,8</sup> Yilmaz et al have shown that pubertal children had a predominant growth of candida.<sup>9</sup> As the child grows, the alteration in the hormonal milieu causes the vaginal epithelium to mature and an increased glycogen content under the estrogen influence causes the P<sup>H</sup> of the vagina to become acidic. At this age they are more prone to develop fungal infections due to prolonged occlusion with tight fitting undergarments and poor drying after washing at school or home. The hygiene practices and environmental factors such as worm infestations play a role throughout early, mid childhood and puberty. These findings correlated well with our observation that candida infection could be demonstrated in young children up to 2 years and pubertal girls. If candidal vaginitis is seen in children in

the age group 2-9 years, sexual abuse should be excluded.<sup>10</sup>

Among other infections, viral infection rarely causes VD. However, herpes simplex virus is the most common pathogen that can be vertically transmitted from mother to child during labour. Diagnosis of HSV infection beyond neonatal period in a girl with VD sexual abuse must be suspected.

VD due to threadworm infestations is not uncommon.<sup>11</sup> The child is usually brought with a complain of nocturnal perianal pruritus. Excoriation and VD are seen in some girls. These infections are more common in areas of overcrowding and associated with poor hygiene. In our study 15% [3/20] had pinworm infestation which could be demonstrated by strip method.

All VD of infective aetiology should be adequately treated with appropriate drug. Antibiotics are to be prescribed only when a pure or predominant growth of a pathogenic bacteria is grown in culture of the vaginal secretions.<sup>12</sup> According to Stricker et al, infections and chemicals are common cause for VD in girls.<sup>13</sup> Irritant dermatitis can be secondary to using harsh soap, bubble bath and prolonged contact with excreta like urine and faeces.<sup>3</sup> In our study one child in group A presented with VD had a contact dermatitis. VD with feculent odour indicates a rectovaginal fistula.<sup>14</sup> Sexual abuse, systemic infections and fistula were not noted as cause for VD in this study.

## CONCLUSION

VD in children is a difficult to manage situation. Unless noted by the care giver many times correct information cannot be obtained. Making an aetiological diagnosis is very important as not all VD in children is infective due to bacteria or candida. Anti-fungal and anti-bacterial agents should not be prescribed in children with VD as a routine without adequate clinical and or microbiological evidence. Pin worm infestation should be considered a differential diagnosis in girls with perianal excoriation and nocturnal worsening of symptoms. Dermatological conditions can be direct or secondary cause to VD in girls. Herpes and candidal infection beyond neonatal period and 2 years of age in pre pubertal girls with VD must rouse a suspicion of sexual abuse.

## ACKNOWLEDGEMENTS

We acknowledge the Laboratory of GRH, KMC for helping to get the investigations for the patients.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the institutional ethics committee*

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**Cite this article as:** Kumar P, Suguna K, Lavanya P. Aetiology of vaginal discharge in children. *Int J Res Dermatol* 2017;3:83-7.