

## ORIGINAL ARTICLE

### Profile of Microorganisms Causing Vaginal Discharge in Reproductive Women at Dr. Pirngadi Hospital in Medan

Iqrina Widya Zahara<sup>1</sup>, Irma D. Roesyanto<sup>2</sup>, Sri Amelia<sup>3</sup>

<sup>1</sup>Postgraduate Program in Tropical Medicine, Universitas Sumatera Utara,

<sup>2</sup>Dermatology and Venereology Department, Universitas Sumatera Utara,

<sup>3</sup>Microbiology Department, Universitas Sumatera Utara

Corresponding email: [iqrinawidyazahara@gmail.com](mailto:iqrinawidyazahara@gmail.com)

**Abstract:** Leucorrhoea or Fluor albus is the discharge of other fluid than blood from vaginal canal out of the ordinary, either smelling or not, and accompanied by local itching. Two factors cause leucorrhoea, namely endogenous factors such as vagina abnormalities and the exogenous factor which are infection and non-infection. This study aims to define the profile of microorganisms causing vaginal discharge in reproductive women. This is a descriptive study with a cross-sectional method conducted at the Skin and Genital Polyclinic of the Sexually Transmitted Infectious Disease Division and the Obstetrics and Gynecology Clinic of Pirngadi Hospital, Medan. Subjects that have met the inclusion and exclusion criteria were included in the study. Vaginal discharge samples were examined for gram staining, KOH staining, bacterial and fungal cultures and wet preparations for parasites. Out of a total of 50 subjects, the majority of the subject are aged 31-40 years, with a history of high school education and working women. The most types of vaginal discharge are pathological (84%) and the most common cause of the vaginal discharge is a fungal infection by *Candida* sp (90%) followed by bacterial infection by *Staphylococcus aureus* (64.8%) and *Klebsiella* (20.3%).

**Keywords:** vaginal discharge, microorganisms, reproductive women

#### INTRODUCTION

Leucorrhoea is one of the problems that many women complain of from young to old age. According to WHO, problems regarding poor reproductive health of women account for 33% of the total burden of disease affecting women worldwide.<sup>1</sup>

Whitish or fluor albus or known as leukorrhoea. Vaginal discharge is an unusual discharge, other than blood, from the vaginal canal, whether smelling or not and accompanied by local itching. The driving

factors for leucorrhoea are endogenous factors from inside the body and exogenous factors from outside the body. Endogenous factors include abnormalities in the vagina, exogenous factors can be divided into two namely infections and non-infection. Infection factors can be due to bacteria, fungi, parasites, viruses, while non-infectious factors are the entry of foreign objects into the vagina either intentionally or not, clean the vagina less cleanly, the area around the vagina is moist, decreased body condition,

activity that is too tired and endocrine or hormonal abnormalities.<sup>2,3</sup>

In 2007 in Indonesia the prevalence of reproductive tract infections caused by bacterial vaginosis by 53% and vulvovaginal candidiasis by 3%. In 2008 the prevalence of reproductive tract infections in adolescent girls and adult women caused by bacterial vaginosis was 46%, *Candida albicans* 29%, and *Trichomonas vaginalis* 12%. In 2007 in Jakarta the prevalence of reproductive tract infections that occurred was *Candidiasis* by 6.7%, *Trichomoniasis* by 5.4% and *Bacterial vaginosis* by 5.1%. Research in the Obstetrics and Gynecology Clinic of Dr. Pirngadi Hospital, Medan, reported that the incidence of *vulvovaginal candidiasis* was 14%; the incidence of *vulvovaginal candidiasis* in the Polyclinic of the Dermatovenereology of Dr. Pirngadi Hospital Medan as much as 55%; the incidence of *vulvovaginal candidiasis* in studies in the PKBRS Gynecology Polyclinic and the Pregnant Women Polyclinic in Pirngadi Hospital Medan as much as 46%.<sup>4</sup>

This research was conducted to look at the profile of microorganisms that cause vaginal discharge in women of reproductive age at Dr. Pirngadi Medan.

## METHODS

This research is a descriptive study conducted by the cross-sectional method. The study was conducted from January 2019 to March 2019.

The inclusion criteria of the study were women with vaginal discharge who came to the Dermatovenereology clinics for the Sexually Transmitted Diseases Division and Obstetrics and Gynecology Clinic Dr. Pirngadi Kota Medan, productive women who suffer from vaginal discharge, women of reproductive age who are married, women of

reproductive age who are pregnant and are willing to participate in research by signing an informed consent. Exclusion criteria were women of reproductive age who were menstruating and women of reproductive age who suffered from physiological vaginal discharge.

Gram staining, KOH staining, bacterial and fungal culture and wet preparations for parasites were examined.

Data collection is done by filling out the questionnaire directly from the research subject. The subject of the research will first be taken his data, then anamnesis will be carried out, and fill out the questionnaire questions after which the sampling will be examined.

Data analysis was performed by compiling data in the form of a frequency distribution table.

**Table 1. Distribution of Subjects by age, education, and occupation.**

	Subject(n)	Percentage (%)
<b>Age group</b>		
21 - 30 years	9	18
31 - 40 years	32	64
>40 years	9	18
<b>Education Level</b>		
Junior high	2	4
Senior high	18	36
Diploma-1	3	6
Diploma-3	14	28
S1 & S2	13	26
<b>Occupation</b>		
Employed	38	76
Unemployed	12	24

## RESULTS

The total number of subjects in this study was 50 people with the majority aged 31-40 years, 32 people (64%), with a high school education level of 18 people (36%) and most of the subjects were employed, 38 people (76%) as seen in tables 1 to 3.

**Table 2. Distribution of Research Subjects Based on Questions Regarding Leucorrhoea Prevention**

Leucorrhoea prevention N(%)		Leucorrhoea N(%)	
		Yes	No
Wash genitals from front to back	Yes	41(82%)	3 (6%)
	No	5 (10 %)	1 (2%)
Use the collected water	Yes	40(80%)	6(12%)
	No	2 (4 %)	2 (4 %)
Change pants 2 times a day	Yes	46(92%)	4 (8 %)
	No	1 (2 %)	0 (0 %)
Use tight underwear	Yes	18(36%)	2 (4 %)
	No	28(56%)	2 (4 %)
Changing underwear	Yes	39(78%)	4 (8 %)
	No	7 (14 %)	0 (0 %)
Wiping with perfume tissue	Yes	12(24%)	1 (2 %)
	No	34(68%)	3 (6 %)
Changing pads	Yes	28(56%)	2 (4 %)
	No	18(36%)	2 (4 %)
Use soft pads	Yes	38(76%)	4 (8 %)
	No	8 (16 %)	0 (0 %)
Using antiseptic fluid	Yes	15(30%)	1 (2 %)
	No	31(62%)	3 (6 %)
Using soap	Yes	26(52%)	2 (4 %)
	No	20(40%)	2 (4 %)
Use pantyliner	Yes	6(12 %)	1 (2 %)
	No	40(80%)	3 (6 %)
Replacing pantyliner	Yes	8(16 %)	0 (0 %)
	No	38(76%)	4 (8 %)
Using non-perfume pantyliner	Yes	12(24%)	1 (2 %)
	No	34(68%)	3 (6 %)
Shaving pubic hair	Yes	36(72%)	2 (4 %)
	No	10(20%)	2 (4 %)
Clipping nails	Yes	35(70%)	3 (6 %)
	No	11(22%)	1 (2 %)

The most types of vaginal discharge suffered by research subjects are pathological vaginal discharge as much as 84%, with symptoms of vaginal discharge that are often complained of is the color of vaginal discharge such as milky white, sour smell, lumpy, leaving itching and many.

**Table 3. Distribution of Leucorrhoea by category and symptoms**

Leucocorrhea Category	Amount	Percentages (%)
Pathological	42	84
Physiological	8	16
<b>Symptoms Complained</b>		
Leucorrhoea color		
-Clear	13	26
-White Milk	34	68
-Well Yellowish	3	6
Leucorrhoea odor		
-Sour smell	24	48
-Bad odor	3	6
-No smelling	23	46
Leucorrhea Amount		
-Much	43	86
-Not much	7	14
Leave stains on underwear		
-Yes	43	86
-No	7	14
Leucorrhoea Consistency		
-Clotted	31	62
-Enny	19	38
Cause itching		
-Yes	45	90
-No	5	10
Cause burning or pain		
-Yes	35	70
-No	15	30

Examination of Gram-negative staining and bacterial culture found that the results of *Escherichia coli* bacteria were 14.8% and *Klebsiella spp* bacteria were 20.37% while *Staphylococcus aureus* bacteria 64.8% were obtained through gram staining. Fungal microorganisms are obtained through KOH staining and fungal culture which gives positive results. The total number of fungal microorganisms, namely *Candida spp* species as much as 90%, and no parasites as a cause of the vaginal discharge. The number

of microorganisms both bacteria, fungi, totaling 99 microorganisms exceeds the number of research subjects, 50 people. This is because in examinations conducted on research subjects found 2 microorganisms that cause vaginal discharge in several people of research subjects.

**Table 4. Distribution of microorganisms that cause vaginal discharge**

Microorganism		N	%
Fungal	Candida spp	45	90
	Staphylococcus aureus	35	64.8
	Klebsiella Sp	11	20.3
Bacteria	E.coli	8	0
Parasite	Trichomonas vaginalis	0	0

## DISCUSSION

Khuzaiyah et al, who examined the characteristics of women with vaginal discharge found that 61.2% of research subjects suffering from vaginal discharge were in the age group of 20-35 years. Attitudes and knowledge possessed by women of childbearing age are one of the important factors that can affect the health of reproductive organs. Likewise, the level of education in the same study found that 34.7% of junior high school level was the most suffering from vaginal discharge, followed by 32.7% of high school education level.<sup>5</sup> This is consistent with this study where the majority of women who suffer from vaginal discharge are in their 30s and are at the level of high school education. Epidemiological research states that pathological leucorrhoea can strike women of any age starting from young women, healthy reproductive women, and older women who do not know the economic status, education level, and socio-culture. Although this case can be found more in women who have low levels of education and socioeconomic status.<sup>6</sup>

The study also found that the majority of women who suffer from vaginal discharge are already working. For women who work, time is everything so they are more likely to prioritize consuming practical food so that the fulfillment of daily nutrition becomes unbalanced. Poor eating patterns by consuming too much fast food and drinks that do not meet the nutritional intake that is not balanced can lead to vaginal discharge. Women who work also usually will have a workload that is too heavy or a lack of balance between activities at work and activities at rest and can trigger stress. Stress that occurs will trigger the onset of stress hormones that can have negative consequences. In some women who have a stress load that is too heavy will be able to trigger vaginal discharge. Some experts argue that vaginal discharge that occurs in women who work is caused by increased production of stress hormones.<sup>7</sup>

Some things can be done to deal with vaginal discharge conditions such as cleaning intimate organs with a cleanser that does not interfere with the stability of the pH around the vagina where one of them is cleaning products made from milk-based ingredients that can maintain pH balance while increasing normal flora growth and suppress the growth of hostile bacteria, avoid the use of powder on female organs with the aim that the vagina is fragrant and dry all day, always dry the vaginal area before dressing, using dry underwear, using underwear that absorbs sweat, using non-tight clothing, changing pads when menstruating, using pantyliner when necessary only and not too long.<sup>8,9</sup>

This study found that the most types of vaginal discharge suffered by research subjects were a pathological vaginal discharge that is equal to 84%. This is by Adawiyah's study, which stated that the most

research subjects suffered pathological vaginal discharge as much as 53.3%.<sup>10</sup> Young women who came to the health facility complained of discharge (discharge) from the vagina (vaginal discharge), mostly due to cleanliness (bad hygiene), there are foreign objects in the vagina (spiral) and experience sexual abuse. In women of reproductive age who suffer from vaginal discharge is most likely caused by an infection, and the most frequently encountered is the emergence of infection due to the use of oral contraceptives after giving birth. In older women, most likely caused by malignancy, especially cervical cancer.<sup>11</sup>

Based on the symptom frequency distribution table in this study, it was found that most of the research subjects experienced vaginal discharge that experienced discoloration, odor changes, large amounts and leaving stains on underwear, consistency of lumps of whiteness, as well as having accompanying symptoms in the form of itching and burning or feeling sore. In the vagina there are various kinds of bacteria, 95% of the vaginal bacteria are *Lactobacillus* and the rest are harmful bacteria or are bacteria that can cause disease. In the vaginal environment with a balanced condition, pathogenic bacteria will not interfere. Maintaining the acidity of the pH to remain normal is an important role for normal flora bacteria in the vagina. With this level of acidity, *Lactobacillus* will flourish and pathogenic bacteria in the vagina will die. In certain circumstances, the pH level can change to high or become lower than normal pH. If the pH level in the vagina becomes higher than 4.2 (less acidic), the fungus will be able to grow and develop, resulting in the

*Lactobacillus* bacteria will become defeated and die from pathogenic bacteria.<sup>12,13</sup>

In this study, it was found that bacteria that caused the most leucorrhoea were *Staphylococcus aureus*, followed by *Klebsiella spp* and *Escherichia coli*. The *Staphylococcus aureus* colony is round, smooth, raised and shiny, and is gray to dark brown in yellow. This bacterium has a coagulase that can coagulate plasma containing oxalate or citrate so that it has the potential to become an invasive pathogen. *Staphylococcus aureus* produces catalase which converts hydrogen peroxide to water and oxygen. *Staphylococcus aureus* can cause bacterial vaginitis characterized by reduced hydrogen peroxide produced by *Lactobacillus*. Based on the literature, one type of *Klebsiella spp* that can cause bacterial vaginitis is a type of *Klebsiella pneumoniae*. This bacterium is present in the airways and feces in about 5% of normal individuals, where the symptoms of vaginitis are inflammation of the vaginal mucosa, burning, irritation, and discomfort. *Escherichia coli* is a normal flora in the gastrointestinal. This bacterium has a K antigen in the form of polysaccharide which is a virulence factor. The K antigen causes *E. coli* to attach bacteria to epithelial cells before invading the digestive tract and urinary tract, and these bacteria have bacteriocin in the form of colicin. *E. coli* found in vaginal secretions can occur due to contamination by rectal microorganisms and can cause bacterial vaginitis also due to reduced hydrogen peroxide produced by *Lactobacillus*.<sup>14,15</sup>

The most common cause of vaginal discharge caused by fungi in this study is *Candida spp*. which is the fungus that most often causes opportunistic infections in humans. *Candida spp*. is a potential pathogen and can produce toxins that can interfere with

the immune system. If this infection is not treated immediately it can reduce immunity and cause complications. One of the diseases with the most common vaginal discharge symptoms caused by *Candida spp* fungus infection is Candidiasis Vulvovaginitis where the prevalence is ranked second as infectious vaginitis and *Candida spp*. The most common cause of candidiasis vulvovaginitis is *Candida albicans* which is 70- 75%.<sup>16</sup>

### CONCLUSION

Most microorganisms that cause vaginal discharge are *Candida spp*, while the bacteria that cause vaginal discharge are *Staphylococcus aureus*, *Klebsiella spp*, and *Escherichia coli* bacteria. No *Trichomonas vaginalis* infection was found.

### REFERENCES

1. Ramayanti. Pola mikroorganisme fluor albus patologis yang disebabkan oleh infeksi pada penderita rawat jalan di klinik ginekologi rumah sakit umum Dr. Kariadi Semarang [Tesis]. Semarang: FK UNDIP / RS KARIADI; 2004.
2. Bahari H. Cara mudah atasi keputihan. Jakarta: Buku Biru; 2012.
3. Kusmiran E. Reproduksi remaja dan wanita. Jakarta: Salemba Medika; 2011.
4. Darmani EH. Hubungan antara pemakaian AKDR dengan kandidiasis vagina di RSUP Pirngadi [Tesis]. Medan: Fakultas Kedokteran Universitas Sumatera Utara; 2003.
5. Khuzaiyah S, Krisiyanti R, Mayasari IC. Karakteristik wanita dengan fluor albus. Jurnal Ilmiah Kesehatan (JIK). 2015;7(1).
6. Sivakumar K, Ajay RS, Sujatha K. A Comparative interventional study on the efficacy of single and multiple-dose combination drug regimen of leucorrhea among women in the reproductive age group. International Journal of Community Medicine and Public Health. Apr 2017; 4 (4): 1230 – 1237.
7. Fransisca J. Hubungan antara stress psikis menjelang UAN dan SNMPTN dengan kejadian fluor albus pada siswi SMA peserta bimbingan belajar [Skripsi]. Surakarta: UNS; 2013
8. Wijayanti D. Fakta penting seputar kesehatan reproduksi wanita. Yogyakarta: Book Marks; 2009: 59.
9. Sulistianingsih R, Djarot HS, dan Wahyuni D. Hubungan pengetahuan dengan sikap wanita usia subur (WUS) tentang keputihan fisiologis dan patologis di lapas wanita kelas IIA kota Semarang. Jurnal Kebidanan Universitas Muhammadiyah Semarang; 2011.
10. Adawiyah KD. Hubungan pengetahuan, sikap, dan perilaku kesehatan reproduksi dengan kejadian keputihan (fluor albus) pada siswi SMA sederajat di wilayah Tangerang Selatan [Skripsi]. Jakarta: Fakultas Kedokteran dan Ilmu Kesehatan Unviversitas Islam Negeri Syarif Hidayatullah; 2015.
11. Hollingworth T. Diagnosis banding dalam obstetri dan ginekologi. Jakarta: Penerbit Buku Kedokteran EGC; 2012. p.40.
12. Greer IA, Cameron IT, Mangowan B. *Vaginal discharge*. Problem-based on obstetrics and gynecology. London: Churchill Livingstone; 2003 p. 37–90
13. Imiawati H, Kuntoro. Pengetahuan personal hygiene remaja putri pada kasus keputihan. Jurnal Biometrika dan Kependudukan, Juli 2016: 5(1); 43–51.
14. Brooks GF, Butel JS, Morse SA 2007. Medical Microbiology. Ed. 23. Jakarta: EGC; 2007.

15. Razzak MSA, Al-Charrakh AH, Al-Greitty BH. Relationship between lactobacilli and opportunistic bacterial pathogens associated with vaginitis. *North American Journal of Medical Sciences*. 2011 Apr; 3(4):185-192.
16. Bradford LL, Ravel, J. The vaginal mycobiome: A contemporary perspective on fungi in women's health and diseases. *Virulence*. 2017; 8(3): 342-351.

