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Micro-organism resistency's pattern causing leucorrhea in post-menopausal women in Medan, Indonesia

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SUMMARY: **Micro-organism resistency's pattern causing leucorrhea in post-menopausal women in Medan, Indonesia.**

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Objective. *To know the pattern of resistance of micro-organisms causing leucorrhea in post-menopausal women.*

Methods. *A descriptive cross sectional study, conducted in Department of Obstetrics and Gynecology H. Adam Malik General Hospital Medan as Universitas Sumatera Utara's Teaching Hospital and other it's networking hospitals. When the study began in January 2016 until December 2017, the sampling was done by consecutive sampling, with samples count were 126 post-menopausal women. Vaginal secretions were taken from the posterior fornix or lateral vaginal wall, sent to the Microbiology Department of Faculty of Medicine Universitas Sumatera Utara, to be cultured into the media: Sabaroud Dextrose Agar (SDA), Blood Agar, Mac Conkey (MC) and then tested the resistance.*

Results. *From 126 post-menopausal women, most of respondents was 40-50 years old (57.1%) with mean ages of 50.6 years old and mean menopause time of 4.5 years, most of respondents 39 people (31 %) in high education, most of them (120 people) is still in couple (95.2%).*

Candida albicans was the most common cause of vaginal discharge (52.4%), Staphylococcus aureus (26.2%), and Escherichia coli (16.7%). While Klebsiella pneumoniae, Klebsiella oxytoca, and Proteus mirabilis and none of the parasites Trichomonas sp were not found. From the resistance test there are 18 (87.7%) Escherichia coli which is sensitive to Ciprofloxacin, there are 18 (54.55%) sample of Staphylococcus aureus which is sensitive to Vancomycin and all sample with Candida albicans (100%) sensitive to Fluconazole.

Conclusion. *The most common micro-organisms causing leucorrhea in post-menopausal is Candida albicans and all of them are sensitive to Fluconazole.*

KEY WORDS: Leucorrhoea - Post-menopause - Micro-organism resistance.

Background

Women have many problems with the vaginal area. The most cases are leucorrhea. Leucorrhea is a condition of persistent and exaggerated vaginal secretions. It can be physiological or pathological and observed as a sign of vaginitis (vaginal inflammation). Vaginal infections can occur when germs such as bacteries and viruses enter the vagina through exchange of fluids or through skin injuries. Having sex, taking strong antibiotics for a long time, stressful conditions and the use of hard soap can cause vaginal infections and cause leucorrhea (1).

Leucorrhea risk occurs at the time of menopause (2). Decreased circulating estrogen associated with menopausal transition is closely related to decreased Lactobacillus vaginalis, increased vaginal pH, morphological changes in epithelium, reduced vascular flow, and decreased secretion of fluid in the vagina (3, 4).

Based on the former study, Siregar have done a research that compares vaginal pH between menopausal woman and non-menopausal woman. The result in mean vaginal pH in menopausal group is 6,07 ± 0,72 and 3,8 ± 0,89 in non menopausal group, a statistically significant difference with p <

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0,001. That pH change and tropical climate with high humidity factor in Indonesia especially in Medan become one of the risk factor for vaginal infection for post-menopausal woman in Indonesia (5).

At menopause, the sensitivity of the oocyte in responding to Gonadotropin Hormone stimulation disappears. At menopause there is also a decrease in estradiol levels, so low estradiol levels can decrease negative feedback to the hypothalamus and pituitary (6).

Bacterials, Yeasts, and Trichomoniasis vaginalis also, do not usually occur in post-menopausal women but may occur in women with risk factors (7). Lactobacillus sp., Fungals, and bacterial vaginosis are less commonly found in post-menopausal women than in women of reproductive age. A large number of post-menopausal women do not have Lactobacillus vaginalis and no bacterial-related bacterial vaginosis (8).

Gunawan et al. have done the same research in Medan, Indonesia in 2015, and they concluded that post-menopausal woman has vagina at risk of infection and inflammation. Many causes of vaginal discharge in post-menopausal women, although there have been several studies examining the causes of vaginal discharge during menopause, research on the pattern of germ resistance is limited (9). For this reason researchers want to see how the pattern of bacterial and germicidal resistance in post-menopausal women.

Methods

This descriptive with cross-sectional study design assessed the pattern of resistance of micro-organisms causing leucorrhea in post-menopausal women who visited the Gynecology clinic of H. Adam Malik General Hospital Medan as Universitas Sumatera Utara's Teaching Hospital and other Faculty of Medicine's Networking Hospital. The study begins in January 2016 until December 2017.

Target population is all post-menopausal women suffering from vaginal discharge. The sample of the research were post-menopausal women who suffered from leucorrhea and visited the Gynecology clinic of all our hospitals. Sampling is done by consecutive sampling.

The inclusion criteria were post-menopausal women who suffered from vaginal discharged, not suffering from chronic illness, not being on medication, never undergoing hysterectomy, never getting hormone therapy less than 6 months earlier, and willing to take part in the research. Exclusion criteria in this study was no breeding of micro-organisms in vaginal discharge preparations.

Research procedures

After obtaining approval from the ethical commitee to undertake the research, the study begins by collecting research subjects according to inclusion and exclusion criteria. Personal data access to health care system, smoking habit, psychiatric consultation, history of psychotropic drug use and hormone therapy treatment alternative to menopause was collected.

Vaginal discharge sampling in which the sample is taken from the posterior fornix or lateral vaginal wall using the Ayre spatula and with sterile lid cotton by using speculum to smear on the slide. Then sent to the Microbiology Department of Faculty of Medicine Universitas Sumatera Utara, to be cultured in agar media, such as: Sabaroud Dextrose Agar (SDA), Blood Agar, Macconkey Agar (MC).

If there is gram-positive coccus growth with grape-like shape, then planting into Mannitol Salt Agar (MSA) and sensitivity test done with Vancomycin and Oxide. If the gram negative rods are found, it is necessary to identify with gram staining. Then proceed with biochemical reaction and sensitivity test with Ciprofloxacin and Doxycycline. Furthermore, if Yeast cell or Candida species found, continued test species with Cornmeal Agar and gram staining then sensitivity test done with Fluconazole and Voriconazol.

An antibiotic type assessment is performed which is sensitive and resistant based on the extent of the area suppressed by the growth of micro-organisms by placing antibiotics on paper discs placed on the agar medium. The medium was then incubated for 24 hours at 37°C and viewed the inhibition zone (halo zone) formed around the paper disc.

Result and discussion

Research has been conducted on 126 post-menopausal women who visited gynecological outpatient clinic of H. Adam Malik General Hospital Medan as Universitas Sumatera Utara's Teaching Hospital and other it's networking hospitals from January 2015 until December 2016 with leucorrhea

complaints. Based on Tables 1 and 2, the most age number of the respondents was 40-50 years old, a total of 24 people. While the mean age of the study subjects was 50.6 years old with an average length of menopause of 4.5 years (SD ± 3.4 years). Most of respondent's education is in Senior High School Level with number of 13 (31.0%). In marital status of respondents, it is found that most of them are in couple with a number of 40 people (95.2%).

Based on Table 3, it was found that Candida sp. is the most common cause of leucorrhea, which is 52.4%. This result is similar to a research conducted

TABLE 1 - CHARACTERISTICS OF RESEARCH SUBJECTS.

Characteristic	N	Presentage (%)
Age (Years Old)		
• **40-50**	72	57.1
• **51-60**	48	38.1
• **>60**	6	4.8
Educational Level		
• **Elementary**	30	23.8
• **Junior High School**	33	26.2
• **Senior High School**	39	31.0
• **College**	24	19.0
Marital Status		
• **In Couple**	120	95.2
• **Widow**	6	4.8
Total	126	100

TABLE 2 - MEAN AGE OF MENOPAUSE RESEARCH SUBJECT.

Characteristic	Mean	Standard Deviasi
Age	50.6	5.4
Menopause Length	4.5	3.4

TABLE 3 - RESULTS OF MICROBIAL EXAMINATION CAUSING LEUCORRHEA.

Microorganism Type	Positive N (%)	Negative N (%)
E. Coli	21 (16.7)	105 (83.3)
Staphylococcus aureus	33 (26.2)	93 (73.8)
Candida sp	66 (52.4)	60 (47.6)
Trichomonas sp	0 (0)	126 (100)
Klebsiella pneumoniae	9 (7.1)	117 (92.9)
Klebsiella oxytoca	6 (4.8)	120 (95.2)
Proteus mirabilis	6 (4.8)	120 (95.2)

in Abidjan, which states that the most commonly found microbial species are Gardnerella Verminitis (47%), Candida albicans (29.4%), Chlamydia trachomatis (13.7%), Trichomonas vaginalis (6.9%), and Neisseria gonorrhea (2.9%) (4). Gunawan et al. found the similar results with Abdijan and this study (9). In contrast to Lakshmi et al. (2012) found that Escherichia coli, Staphylococcus aureus, and Candida sp. isolated about 14.8, 9.3, and 13% in post-menopausal women (4).

Based on Table 4, it was found that 87.7% Escherichia Coli were sensitive to Ciprofloxacin and 14.3% were resistant. In contrast to doxycycline in which only 14.3% Escherichia coli were sensitive to doxycycline and 87.7% were resistant. With Fisher Exact Test there was no significant relationship between Ciprofloxacin and Doxycycline ($p>0.05$). For Staphylococcus Aureus Group, there are 54,5% were sensitive to Vancomycin and 45.5% were resistant. Meanwhile, 54.5% of Staphylococcus Aureus Group were resistant to Oxacillin and the remainder 45.5% were sensitive to Oxacillin. With Fisher exact test there was no significant relationship between Vancomycin and Oxacillin ($p>0.05$). All Candida albicans (100%) were sensitive to Fluconazole and half of them (50%) were also sensitive to Voriconazole, indicating that the best Leucorrhea therapy due to Candida albicans with Fluconazole..

From the study of Laksmi et al. found that most Gram Positive bacteria were found to be susceptible to Penicillin, 3rd generation Cephalosporins, Erythromycin, and Oxacillin. Three of the Staphylococcus aureus species are resistant to Oxacillin (Methicillin Resistant Staphylococcus aureus or MRSA) (10). All MRSA strains are susceptible to Vancomycin. Gram-negative bacteria are found to be particularly susceptible to Amicacin, Gentamicin, and Ceftazidime (11, 12).

Conclusion

- From the 126 post-menopausal women who suffered leucorrhea the most number is the age of 40-50 years old, in Senior High School education, and most of them is still in couple. The mean age of post-menopausal women suffering from vaginal discharge is 50.6 years old with an average length of menopausa 4.5 years.

TABLE 4 - RESISTANCE TEST RESULT OF MICRO-ORGANISM CAUSING LEUCORRHEA.

Microorganism Type	Sensitive n (%)	Resistance n (%)	*P*
Escherichia Coli (7 Samples)			
- Ciprofloxacin	6(87.7)	1(14.3)	0.142
- Doxycycline	1(14.3)	6(87.7)	
Staphylococcus Aureus (11 Samples)			
- Vancomycin	6(54.5)	5(45.5)	1.000
- Oxacyllin	5(45.5)	6(54.5)	
Candida Albicans (22 Samples)			
- Fluconazole	22(100)	0(0)	1.000
- Voriconazole	11(50)	11(50)	

- The leucorrhea micro-organisms in post-menopausal women were Candida albicans, Staphylococcus aureus, E. Coli, Klebsiella pneumonia, Klebsiella oxytoca, and Proteus mirabilis.
- From the results of resistance testing on micro-organisms causing leucorrhea in post-menopausal women found Escherichia coli is still sensitive to Ciprofloxacin, Staphylococcus aureus is still sensitive to Vancomycin and Candida albicans is still sensitive to Fluconazole. From the results of bivariate test of Escherichia coli bacteria, there was no significant relationship between Ciprofloxacin use with Doxycycline, and for Staphylococcus aureus bacteria did not find a significant relationship between Vancomicin use and Oxacillin use.

Suggestion

From the research that has been done can be seen various kinds of leucorrhea micro-organisms so that every post-menopausal women who complain of vaginal discharge should be recommended to evaluate vaginal secretions and resistance tests to prevent the use of irrational antibiotics that can lead to drug resistance and avoid inefficient treatment.

Further research is needed with larger number of samples and wider area of resistance test of Leucorrhea micro-organisms and with more varied types of antibiotics in order to obtain better results to become a treatment reference for cases of vaginal discharge in post-menopausal woman in Indonesia.

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