

Association between the Use of Pessary and the Length Use of Pessary with the Incident of Bacterial Vaginosis on Pelvic Organ Prolapse Patients

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Abstract

Introduction and Hypothesis: Pelvic Organ Prolapse (POP) is a condition with specific signs such as descent of the fornix anterior, fornix posterior, uterine, cervix, apex of the vagina after hysterectomy or perineal. The use of pessary is a conservative and the first line of POP medication. Most women who used pessaries complained about vaginal discharge, more than 50% of them were proven suffered from bacterial vaginosis. This research was aimed to know whether there was any association between the incident of BV with the use of pessaries and the length use of pessaries among POP patients. We hypothesized that the use of pessaries and the length use of pessaries had a significant association with the incident of BV. This study was a case-control study. There were 68 medical records, which were obtained through purposive sampling. Independent variables were the use of pessaries and the length use of pessaries, the dependent variable was the incident of BV among POP patients. Data collection sheets were the instrument of this research. Chi-Square, Fisher Exact Test and Odd ratio were used to analyze the data. This research used α : 5%, CI: 95% Result: This research revealed that there was a significant association between the incident of BV on POP patients with the using of pessaries ($P=0.001$) and the length use of pessaries ($P=0.024$). Odd ratio 5.9 (95% CI, 1.95-17.97) means patients with POP who used pessaries had a probability to suffer BV 5.9 times higher than those who didn't. Conclusion: there was a significant association between the incident of BV with the use of pessaries and the length use of pessaries on POP patients.

Keywords: bacterial vaginosis, pelvic organ prolapse, pessary, the length used, the usage

Introduction

Pelvic Organ Prolapse (POP) is a kind of disruption of the pelvic organ such as vagina, rectum, uterine and bladder, they are going down into the hiatus genital.¹ Medium and higher stages of POP induce many complaints, those complaints are a bulge of the vagina, difficulty of voiding and constipation, sexual dysfunction,

declining quality of life such as mood swings, disturbing of resting needs and social activity.² A pessary is the first line of POP medication, 89% gynecologists and 98 % urogynecologists used pessaries to relieve patients' complaints which were related to POP.³ Women with POP who followed one-year medication of both conservative and operative, they declared that they had improvement of voiding, defecating, sexual function and quality of life.³ A pessary is a modest, effective and efficient device, at the other side, patients who used pessaries for a long time, they had to deal with the probability of suffering bacterial vaginosis (BV), the user of pessary had 4.37 times higher to suffer BV than women with POP who didn't use it.⁴ Therefore there was a controversial statement in a study which had done by Yoshimura et al in 2016. They used the conventional

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method and clone library method. The conventional method revealed that the using of pessaries lead the users to suffer BV and the clone library method stated that pessary didn't always disturb normal vagina flora, especially in those who had lactobacillus spp. before pessaries wearing.³

BV is an abnormal discharge from the vagina. Most of the women at reproductive ages complains about BV. Half of them didn't realize the signs of BV, the risk factor of Sexual Transmitted Disease (STD) include Human Immunodeficiency Virus (HIV), endometritis post-abortion, and it has side effect for pregnancy such as miscarriage and preterm labor.⁴

Women with POP who used pessaries have to deal with the probability of suffering BV which could induce STD, HIV, abortion and preterm labor.^{4,5}

The researcher had done a preliminary study in Gynecology Outpatient of Doctor Soetomo General Hospital Surabaya, the preliminary study revealed that POP and BV were belong to top ten diseases which were brought the patients to follow medication.

Based on the background above, researchers wanted to find whether there was any association between the incident of BV with the use of pessaries and the length use of pessaries on POP patients in Doctor Soetomo General Hospital Surabaya.

Methods and Material

This research was an observational analytical case control study. The independent variables were the use of pessaries and the length use of pessaries on POP patients, while the dependent variable was the incident of BV among POP patients. The population was POP patients' medical records in Gynecology outpatient Doctor Soetomo General Hospital Surabaya in the period of January 2017 till December 2018. The number

of population were 117 outpatient medical records' POP patients. This study applied a proportion of case and control, it was 1:1. The case in this research was POP patients who used pessaries, and the control of this research was POP patients who didn't use any pessaries. From those medical records, samples were taken by purposive sampling. The amount of the samples were 68 medical records, 34 medical records of POP patients who used pessaries at least 2 weeks and 34 medical records of POP patients who didn't use any pessaries. The patients' records were carefully reviewed. Data collection included age, parity, whether each of them used pessaries or not, mode of delivery, vaginal swab results.

Nugent score was used to determine whether patients suffered from BV or not.⁶ Nugent score 0-6 was interpreted as negative for BV, and Nugent score 7-10 was interpreted as positive for BV.⁶

This research used univariate and bivariate analysis. A univariate analysis was used to analyze the frequency distribution of each variables' characteristics. Data of this category will be presented with the size of the presentation or proportion. A bivariate analysis was used to count the proportion of POP patients who used pessaries and POP patients who didn't use any pessaries to determine whether there was any association between the incident of BV with the use of pessaries and the length use of pessaries on POP patients. Chi-Square and Fisher Exact Test were bivariate analysis which researchers used to analyze the data, we used α : 5%, CI: 95%. Contingent Coefficiency was used to determine the closeness of the association between independent and dependent variables. The researcher used Statistical Package for The Social Science (SPSS) to analyze data, this study used $p < 0,05$ to state whether there was any association between the incident of BV with the use of pessaries and the length use of pessaries on POP patients.

Findings

Table 1 Characteristics Patients of Pelvic Organ Prolapse in Gynecology Outpatient of Doctor Soetomo General Hospital Surabaya Year 2017-2018

	Pessaries (%)	Without Pessaries (%)	P value
Age			
<50	0 (0)	5 (7.35)	0.053
≥ 50	34 (50)	29 (42.65)	
Parity			
< 4	8 (11.76)	15 (22.06)	0.073
≥ 4	26 (38.24)	19 (27.94)	
Mode of Delivery			
Vaginal Delivery	34 (50)	34 (50)	-
Sectio Caesaria	0 (0)	0 (0)	

Table 1 describes most of the patients who suffered from POP attain the age of 50 or older. Most of them had parity 4 or higher and all of them had undergone vaginal delivery. There was no association between age and parity with POP patients tendency to choose medication with or without any pessaries. It was concluded by p-value, which p-value for both of them was higher than 0,05 ($p > 0.05$).

Table 2 Proportion of Incident Bacterial Vaginosis on POP Patients with Pessaries and without Pessaries in Doctor Soetomo General Hospital Surabaya Year 2017-2018

POP	Positive BV (%)	Negative BV (%)	Total (%)
Pessaries	19 (55.8)	15 (44.12)	34 (100)
Without Pessaries	6 (17.65)	28 (82.35)	34 (100)
Total	25	43	68

Table 2 describes the proportion of incident BV on POP patients with pessaries were almost 3 times higher (55.8%) than those ones who didn't use any pessary (17.65%).

Table 3 The Results of Cross Tab Analytic For The Use of Pessaries in POP Patients And The Incident Of Bacterial Vaginosis

Test's Name	Results
Chi Square	0.001
Contingen Coeficiency	0.369
Odd ratio	5.9

Table 3 describes the results of chi-square, contingent, and odd ratio. Chi-Square test gave $p = 0.001$, it means that there was an association between the incident of bacterial vaginosis and the use of pessaries on the POP patient. Contingent Coefficiency resulted from 0.369, it means the closeness association

between the incident of bacterial vaginosis and the use of pessaries on the POP patient was low. The odd ratio was 5.9, means POP patients who used pessaries had a probability 5.9 higher to suffer bacterial vaginosis than those who didn't use any pessary.

Table 4 Period of Pessaries Setting Up and the onset of Incident Bacterial Vaginosis in RSUD. Dr. Soetomo Surabaya Year 2017-2018

Period of Pessaries Setting Up	The Amount of POP patients with pessaries who suffered from bacterial vaginosis (n= 19) (%)
2 weeks- < 6 month	6 (31.7)
6 month - < 1 year	7 (36.8)
1 - < 2 year	2 (10.6)
2 - < 3 year	1 (5)
≥ 3 year	3 (15.9)

Table 4 describes most of the POP patients who used pessaries complained about bacterial vaginosis in the first year of pessaries setting up, but there were some of POP patients who complained about bacterial vaginosis after 3 years of pessaries setting up.

Table 5 Proportion Onset Incident of Bacterial Vaginosis on POP Patients Based On The Length Use of Pessaries

The Length Use	Positive for BV (%)	Negative for BV (%)	Total (%)
2 weeks - < 6 months	6 (17.65%)	0 (0)	6 (17.65)
≥ 6 months	13 (38.24)	15 (44.12)	28 (82.35)
Total	19	15	34(100)

Table 5 describes that POP patients who used pessaries for more or equal than 6 months were two times higher of suffering BV than those who used pessaries between 2 weeks and less than 6 months.

Table 6 : The Result of Cross Tab Analytic for The Length Use of Pessary and Incident of Bacterial Vaginosis

Test's Name	Results
Fisher Exact Test	0.024
Contingent of Coefficient	0.38

Table 6 describes that there was a significant association between the length use of pessary with the incident of bacterial vaginosis on POP patients, there was a weak association between the length use of pessaries and the incident of BV.

Discussion

Pelvic Organ Prolapse (POP) is a multifactorial disease, even it doesn't lead to mortality, but it does reduce the quality of life, induces mood swings, leads to sexual dysfunction, disturbs women to connect to their social interaction.² Aging is one of the significant risks for the incident of pelvic organ prolapse. Aging is related to estrogen and progesterone declining, which both of them are used to take care of the connective tissue and matrix cellular, they have a role to support the pelvic organ.^{2,7-10} Women who have got history of giving birth once, they have to deal with the probability of 2.6 times higher to suffer POP than women who have never given birth. Women who've got history of giving birth 2 times, they have to deal with an increasing probability to suffer POP 3 times higher than those who have never given birth.^{8,10,11} Vaginal delivery has a significant role in the POP incident, women who had undergone vaginal delivery, they are at risk of suffering from pelvic organ prolapse stage 2 or higher.^{8,11-14}

The Pessary offers high effectiveness and efficient way to overcome POP, beside of its positive profile, pessary users have to deal with the probability of suffering bacterial vaginosis.³ This research revealed that the probability was 5.9, and another research which had done by Alnaif&Drutz, it stated that the probability from suffering bacterial vaginosis for those who used pessaries was 4.37.³ Toma et al have done their research in 2017, their research stated there was a significant rising of probability for those who used pessaries from suffering bacterial vaginosis.¹⁶ Pessary in the vagina was considered as a foreign object, hence anaerobic bacterial dominated the vagina, incident of bacterial vaginosis in POP patients could lead to a potential problem such

as smelling vaginal discharge, urinary tract infection, pelvic inflammatory disease, and adverse pregnancy outcomes.³

There was a significant association between the length use of pessaries and incident of BV, there hasn't been any study which proved this result, Alnaif&Drutz stated that most of pessaries users complained about BV at 6 till 12 months after pessary wearing, still there were some of the pessaries users complained about it after 3 years of pessaries setting up.³ Age and the frequent of pessary release were significantly related to bacterial vaginosis in POP patients, POP patients who were older tend to release the pessaries rarely than those who were younger and sexually active.^{17,18} The frequent of pessaries release which was less than once a week, it induced anaerobic bacteria to dominate vagina and escalated incident of bacterial vaginosis at 3 months after pessaries wearing.¹⁸

Conclusion

There was a significant association between the incident of BV with the use of pessaries and the length use of pessaries. This study revealed that the users of pessaries had to deal with 5.9 higher probabilities to suffer BV than those who didn't use any pessary.

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References

1. Yimphong T, Temtanakitpaisan T, Buppasiri P. Discontinuation rate and adverse events after 1 year of vaginal pessary use in women with pelvic organ prolapse. 2018;1123–8.
2. Bradley CS. Progress toward understanding pelvic organ prolapse. *Am J Obstet Gynecol* [Internet]. 2018; 218(3): 267–8. Available from: <https://doi.org/10.1016/j.ajog.2018.01.042>
3. Yoshimura K, Morotomi N, Fukuda K, Hachisuga T, Taniguchi H. Effects of pelvic organ prolapse ring pessary therapy on intravaginal microbial flora. *Int Urogynecol J*. 2016;27(2):219–27.
4. Alnaif B, Drutz HP. Bacterial vaginosis increases in pessary users. *Int Urogynecol J*. 2000;11(4):219–23.
5. Hay P. Bacterial vaginosis. *Med (United Kingdom)* [Internet]. 2014;42(7): 359–63. Available from: <http://dx.doi.org/10.1016/j.mpmed.2014.04.011>
6. Forbes, B.A., Sahm, D.F., Weissfeld, A.S. *Diagnostic Microbiology*. 12th edition. Missouri: Mosby Elseviere; 2007. 871 p.
7. Ashshofa, S.R. *Hubungan Usia dan Jumlah Paritas Ibu terhadap Tingkat Kejadian Prolapsus Uteri di RSUD. Dr. Moewardi Surakarta* [skripsi]. Solo: Universitas Sebelas Maret; 2016.
8. Budinurdjaja, P. *Manajemen Disfungsi Dasar Panggul*. Kalimantan Selatan: PT. Grafika Wangi Kalimantan; 2015.
9. Bradshaw, Cunningham, Halvorson, Hoffman, Schaffer&Schorge. *Williams Gynecology*. 2nd edition. Texas: McGraw-Hill; 2012.
10. Hardianti, B.C. & Pramono, B.A. 2015. Faktor-Faktor yang Berhubungan dengan Kejadian Prolapsus Uteri di RSUP. Dr. Kariadi Semarang. *Media Medika Muda*. 2015; 4(4): 498-508.
11. Anggreni, A., Wulansari, V. dan Darto. Dominant Factors Affecting Uterine Prolapse in Dr. Moewardi Hospital Surakarta in 2013-2015. *Majalah Obstetri dan Ginekologi*. 2017; 25(3): 77-80.
12. Hamamah, J. & Pangastuti, N. Karakteristik Pasien Prolaps Uteri di RSUP. Dr. Sardjito Yogyakarta tahun 2013. *Jurnal Kesehatan Reproduksi*. 2017; 4(1): 17-22.
13. DeLancey, J. O.&Hurd, W. W. Size of The Urogenital Hiatus in The Levator Ani Muscles in Normal Women and Women with Pelvic Organ Prolapse. *Obstet Gynaecol*. 1998; 91(3): 364-8.
14. Dietz, H. P.&Simpson, J.M. Levator Trauma is associated with pelvic organ prolapse. *BJOG*. 2008; 115(8): 979-84.
15. Panayi, D.C.&Khullar, V. Urogynaecological Problems in Pregnancy and Postpartum Sequele. *Curr Opin Obstet Gynecol*. 2009; 21(1): 97-100.
16. Toma, F., Mardiyah, E.& Deborah, K. Peningkatan Resiko arterial Vaginosis pada Pemasangan Pesarium [thesis]. Surabaya: Universitas Airlangga; 2017.
17. Meriwether, K. V., Rebecca, G., Rogers, Craig, E., Peterson, S. D., Gutman, R.E., Iglesia, C. B. ‘The effect of hydroxyquinoline-based gel on pessary-associated bacterial vaginosis: A multicenter randomized controlled trial’, *American Journal of Obstetrics and Gynecology*. 2015; 213(5): 729e1-e9. doi: 10.1016/j.ajog.2015.04.032.
18. Fregosi, N.J., Hobson, D.T.G., Kinman, C.L., Gaskins, J.T., Stewart, J.R. & Meriwether, K.V. ‘Changes in the vaginal microenvironment as related to frequency of pessary removal’, *Female Pelvic Medicine&Reconstructive Surgery*. *JPelvicSurgery*, 2018; 24(2): 166-71. doi: 10.1097/SPV.0000000000000520