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BACTERIAL VAGINOSIS ASSOCIATED WITH PRETERM PREMATURE RUPTURE OF MEMBRANES: A CASE REPORT

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Abstract

Bacterial vaginosis is condition which caused by increasing production of vaginal mucus. Nearly one of five women in Indonesia are affected by bacterial vaginosis. More than thirty percent symptom recurrent in 1 years. A 23 years old woman, first time pregnant coming to emergency department in our hospital. She complained about 32 weeks gestational age came out blood spot and fluid from birth canal since 10 hours ago. She is generally well condition, with no abdominal pain or birth canal pain. Patient complains itchy and reddish vagina. She also have recurrent whitish history previously until now. She also says whitish putrid smells and grey colored somewhat. Speculum sterile examination, looked white to gray mucus with PH 5, Whiff test (+), amin tes (+), Nugent score = 7. Fetal ultrasonography examination shows the amnion are within normal AFI 10 cm. Nitrazine test (+).We present a women with preterm premature rupture of membranes that caused by bacterial vaginosis. The mechanism of preterm labor are breakdown of membrane integrity causing rupture (due to inflammation and the action of the protease enzymes), and include the release of endotoxin, exotoxin and prostaglandin that stimulating cytokines. The Two hypotheses put forward for bacterial vaginosis on preterm labor, first; organisms that move ascending to the uterus and secondly, bacterial vaginosis is a marker of intrauterine colonization by similar organisms. Eventhough bacterial vaginosis did not included sexually transmitted infection, but the impact to preterm pregnancy as well as sexually transmitted infection.

Keywords: Bacterial, Vaginosis, Premature Rupture

Introduction

The whitish plea often attacks women with no-look age. Whitish (Fluor Albus) is the symptom of a discharge from the vagina and did not accompany by blood, which happened in the activity of flora normal which lived in the vagina. The normal flora of the vagina has many types, such as corynebacterium, Bacteroides, peptostreptoccocus, Gardnerella, mobilunucuc, mycoplasma, and Candida spp. In this case, vagina mucus is a natural mechanism to defense against and clean up the various infections. Whitish can occur either normally (physiological) or pathological. One of causing whitish in women is bacterial vaginosis (Bautista et al., 2016).

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For the two last decade, some in vitro and in vivo research have been reported that bacterial vaginosis (BV), was the condition of vagina which common in reproductive age women. It have a biological risk factor that related to sexually transmitted infection (IMS), including chlamydia and gonorrhea. Although the etiology of vaginosis bacterial still unknown, we have been believed that happened when lactobacillus spp, which is the main species of healthy normal flora replaced by anaerobic bacteria, especially Gardnerella Vaginalis. It is causes decrease of H2O2 concentration that marked with increasing production of vaginal mucus, and become grey colored, thin, homogenous, smelling putrid and there are increase vagina PH. BV gives chief complain fishy smells, itchy and redness. But 50 % patients did not give any symptoms. 7. High Incidence of BV founded in woman with pelvic inflammatory disease (PID). But there is no research shows that treatment to BV lower the risk of PID later. Microbial change that causes increase BV, still not all known, so is possibility by sexually transmission still unable to enforce. BV patients have a higher risk against other sexually transmitted infection (IMS). Bv In pregnant women could caused complications such as abortus, premature delivery, premature rupture of membrane and endometriosis postpartum (Clinton, Newell, Downey, & Ferreira, 2017).

A systematic review in 2013 reported that prevalence of BV vary widely across the world. Southern and eastern Africa women have BV (68% higher in Mozambique, 51% in Lesotho, 44% in Kenya, 37 % in Gambia). Women in southeastern Asia, Australia, New Zealand, and Indonesia usually have BV > 30%. Latin and Caribbean woman have lower prevalence of BV. In USA, BV become common condition in women, with prevalence of varying according to race / ethnic African-American (51%), Hispanic (32%), and white (23%). Aboriginal and Canadian women have high native BV (33%) (Pirotta, Fethers, & Bradshaw, 2009).

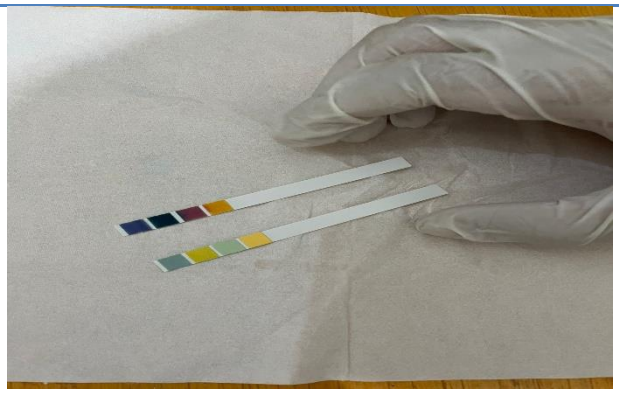
Preterm premature rupture of membranes (PPROM) is defined as rupture of membranes before the onset of labor. The most significant maternal risk of PPROM is intrauterine infection which increases with the duration of membrane rupture. Fetal risks include umbilical cord compression and ascending infection (Ecker et al., 2016).

Preterm premature rupture of membranes (PPROM) is a common clinical condition with significant impacts on obstetric outcome and is considered one of the “great obstetrical syndromes” responsible for spontaneous preterm birth (Lee et al., 2016). The amniotic cavity is a sac made of amnion and chorion known as chorioamnionitis membrane. The product of conception in the amniotic cavity is kept safe and sealed by ithis imembrane. Any ibreach in the integrity of the membrane is rupture of the membrane and the subsequent closer of the breech is considered resealing of ithe imembrane (Fortner et al., 2014). There have been several techniques developed inan attempt to artificially reseal the fetal membranes and prevent leakage of amniotic fluid, iincluding among others: intra-amniotic injection of platelets and cryoprecipitate (amniopatch), isealing ithe icervical icanal, iand ifetoscopic laser coagulation. However, there is as yet no effective and safe technique readily available to achieve this goal

(Akolekar, Beta, Picciarelli, Ogilvie, & D'Antonio, 2015).It is very rare that resealing occurs spontaneously with rewarding outcome.

CASE

A 23 years old woman, first time pregnant coming to emergency department in our hospital. She complained about 32 weeks gestational age came out blood spot and fluid from birth canal since 10 hours ago. She is generally well condition, with no abdominal pain or birth canal pain. Patient complains itchy and reddish vagina. She also have recurrent whitish history previously until now. She also says whitish putrid smells and grey colored somewhat. Speculum sterile examination, looked white to gray mucus with PH 5, Whiff test (+), amin tes (+), Nugent score = 7. Fetal ultrasonography examination shows the amnion are within normal AFI 10 cm. Nitrazine test (+), confirmed PROM. Urinalysis test results looked murky urin yellow color, ph 4, specific gravity 1,010. Microscopic examination, leukosit esterase 7/LP, epithelial 6/LP and bacteria coccus (+)



Result and Discussion

LAND SUBSIDENCE MODEL

Bacterial Vaginosis (BV), previously known as vaginitis nonspecific, because it is associated by bacteria and inflammation process. BV is the most common cause of vaginitis and infection which occurred to the most common gynecological outpatient poly. The characteristics of BV are whitish and fishy smell caused by changes in the normal flora vagina. Whitish BV is typically described as a homogeneous grey pristine liquid that attached to the vaginal mucosa. Many research shows that there were relations between Gardnerella vaginalis and another bacteria that caused BV. (Bautista et al., 2016). BV is known as polymicrobial synergistic infection. Some of species that are associated such as lactobacillus, prevotella and anaerobic bacteria including Mobiluncus, Bacteroides, Peptostreptococcus, Fusobacterium, Veillonella and Eubacterium species. Mycoplasma hominis, Ureaplasma Urealitycum and streptococcus may be involved in BV. (Pirotta et al., 2009)

Bacterial vaginosis is connected with the incidence of preterm labor. These findings are in line with previous cohort studies. A cohort study with a sample of 234 pregnant women presenting with the threat of preterm labor,

bacterial vaginosis and sexually transmitted infections were the most common causes identified in the study and caused preterm labor between 24 to 32 weeks' gestation (McPheeters et al., 2005).

In BV, the vaginal flora change through their mechanism of known and unknown, that causing an increase of local PH. This happens due to reduced lactobacilli which produce hydrogen peroxide. Lactobacilli are organisms that formed a large trunk which helps maintain the healthy acidic PH of vagina and inhibit other anaerobic microorganism through the elaboration of hydrogen peroxide. Mostly, lactobacilli are founded high concentrations in healthy vagina. In BV, the population is greatly reduced, while various types of anaerobic bacteria and G vaginalis are increasing, where G vaginalis forms biofilms in the vagina. Some research suggests that this biofilm may be resistant to some drugs. Dominant Biofilm of G Vaginalis has been proven to survive in hydrogen peroxide (H202), lactic acid, and high levels of antibiotics.

Although BV is not allowed as a sexually transmitted disease, sexual activity has been associated with the development of this infection. The observation that supports this thing include : (1) the incidence of BV increase with an increase in the number of new sexual partner, (2) new sexual partner can be associated with BV, and (3) the male partners of woman with BV may have colonization of urethra by the same organism, but male is not showing any symptoms. More recent studies show that BV is associated with changes in mediators of immune dissolved particular, increased target cell of HIV, and decrease of endogenous antimicrobial activity, which may contribute to increasing risk of HIV transmission

The chief complaint are often obtained of BV such as vaginal odor that's typical of fishy smell (fishy odor) and itching. Malodor complaint are often causes by increasing amin, especially *Trimethylalamina* that is produced by G. Vaginalis, M.Hominis, and Mobiluncus spp. Amin evaporates when vaginal fluid becomes alkaline. Alkaline fluid cement (ph 7,2) causes release amin from the attachment in protein, and evaporate of amin caused a characteristic of odor.

Irritation of the vaginal area or around vagina can cause pain. In this case, the patient complained a history of repeated whiteness with itching symptoms and increasing of abnormal vaginal discharge. This discharge smells fishy and grey-colored. On speculum sterile examination, it appears white to gray secret. Shades of gray in vaginal discharge are a typical pictures of bacterial vaginosis.

The examination shows Whiff test (+), amen test (+), Nugent score =7 . *Whiff* test is one of the tests are typically in BV cases. *Whiff* test or Amen is done by dripping KOH 10% on vaginal discharge. A positive results on *whiff* test that fishy smells or fishy odor.

AMSEL CRITERIA (3 DARI 4)
Homogen mucus, grey, (1 dari 3 kekuningan, encer)
pH vagina >4,5 (spesifikasi rendah)
Whiff test positif (amine test-sensitifitas rendah)
>20% clue cells pada preparat basah (NaCL)/ mikroskopis (>>90% sensitifitas)

This pastient case using criteria of nugent get score =7. Nugent criteria is the gold standar in enforcement diagnosis of BV, because it have excess on objectivity value, sensitivity and specificity. The nugent citeria has 7 score. 0-3 is considered normal, 4-6 is considered as intermediate and 7 or more is an infection of BV

Skor	Lactobacillus (Paralel-sided, Gram-positive rods)	Gardnella/Bacteriodes (Tiny, Gram-variable coccobacilli and rounded, pleomorphic, Gram-Negative rods with vacuoles)	Mobiluncus (Curved, Gram-negative rods)
0	>30	0	0
1	5-30	<1	1-5
2	1-4	1-4	>5
3	<1	5-30	
4	0	>30	

On this case, the presence of vaginitis caused weakness on amniotic membranes that induced preterm premature rupture of membranes. Bacterial vaginosis (BV) in pregnant woman is a risk factor for various types of complications in pregnancy, including preterm premature rupture of membranes. Mechanisms of preterm labor due to infection are part of the breakdown of membrane integrity causing rupture (due to inflammation and the action of the protease enzymes), and include the release of endotoxin, exotoxin and prostaglandin that stimulating cytokines. The Two hypotheses put forward for bacterial vaginosis on preterm labor, first; organisms that move ascending to the uterus and secondly, bacterial vaginosis is a marker of intrauterine colonization by similar organisms (Goffinet et al., 2003).

Bacterial vaginosis in some research can increase interleukin-1 beta levels in women, which in turn can lead to activation of Matrix Metalloproteinases (MMP) such as MMP-1 and MMP-9. Metalloproteinase matrix will act as an enzyme that degrades the extracellular matrix in the cervix and causes cervical weakness due to inflammatory processes. Apart from IL-1B, Il- 6 and IL-8 levels were also increased which induced a tissue inflammatory response. 15 In theory, pathogenic bacteria can move ascending into the uterus and cause inflammation that leads to premature rupture of membranes, premature labor and fetal infection (Verma, Avasthi, & Berry, 2014). In a previous case control study, it was found that 36.54% of pregnant women with urinary tract infections in the population of patients presenting with preterm labor (Granda Velasco, 2020). This is analogous with a study of 272 patients in which 35.6% had positive urine cultures and 32.9% had preterm labor (Lim et al., 2011). Significant associations were also reported by previous investigators, 34% of urogenital infections were observed as a significant cause of preterm labor.

The inflammatory response causes the release of proinflammatory cytokines such as IL-1 beta, IL-6, IL-8 and TNF-α in bacterial vaginosis. This

proinflammatory cytokine will stimulate the release of MMP, especially MP-8. Neutrophils produce MMP-8 and cause degradation of the membrane. MMP-8 can degrade a large number of extracellular matrix proteins such as collagen 1 and III. The process of infection showed increased levels of MMP8 and degradation of proteoglycans that compose the membrane (McPheeters et al., 2005). Concerning to cytokines, amniotic fluid cytokines such as interleukin-1 (IL-1), interleukin-6 (IL-6), interleukin-8 (IL-8), tumor necrosis factor-alpha (TNF-α), and granulocyte colony-stimulating factor (G- CSF) is firmly associated with infection, premature rupture of membranes and preterm labor which cannot be stopped with tocolytic therapy. The cytokines in concert with prostaglandins will stimulate premature labor (Caughey, Robinson, & Norwitz, 2008).

Degradation of amniotic fluid causes preterm premature rupture of membranes. PPROM in premature pregnancy causes maternal and neonatal complications. Some of complications that caused by PPROM such as Premature delivery, chorioamnionitis, placental abruption, postpartum hemorrhage, endometriosis, preterm infants, neonatal sepsis and even death of fetus. In this case, the patient is 23 years old which is the productive age of high sexual activity. Hormonal canges likes decreasing estrogen level, causes increase of vagina PH. This environment is not optimal for lactobacillus spp growth, however conducive to other microorganism that causes BV. This situations also happen in pregnant woman (Caughey et al., 2008).

A Systematic review by Mehta SD on 80 patients with diagnosis of BV showed Whiff test sensitivity was 87% and specificity 96%. The diagnosis of BV is enforced based on Amsel criteria.

Women who suffer from BV are associated with increased risk of STI (sexually transmitted infection) such as HIV, Gonorrhea, Chlamydia, and herpes simplex. Susceptibility of STI transmission is associated with decreasing protection of Lactobacillus, increasing abnormal flora, and decreased secretion of leukocyte protease inhibitor vagina (Pirotta et al., 2009).

Conclusion

The prevalence rate of bacterial vaginosis among pregnant women is high, that significantly associated with preterm delivery. Awareness of the condition and treatment may help to reduce the adverse outcome

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