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Vaginitis Gonorrhea on Children: A case series

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Abstract: *Background: Vaginitis gonorrhea is sexually transmitted infections (STIs) which caused by Neisseria gonorrhoeae and commonly found in children. Frequently, it indicates the sexual abuse in children. Although infrequent,nonsexual gonorrhea transmission, either from fomites, physical contact or autoinoculation may occur in children. Case report: Three cases of vaginitis gonorrhea on 3, 6 and 8 years old girl with a chief complaint of vaginal discharge that felt no itchy are presented. The history of sexual intercourse or abuse in two cases were denied but they had history of sharing baths and public swimming pool. In one case, there was alleged sexual abuse 6 months ago by her cousin. Physical examination revealed the yellowish odor vaginal discharge and there were no signs of inflammation around theygenitalia. There were Gram-negative diplococcal intra and extra cellular. All of Thayer Martin culture revealed a positive result of Neisseria gonorrhoeae. Only one patient performed screening for the other STI, while two patient refused. All ofthese patients were treated with 125 mg intramuscular ceftriaxone injection but only 1 patient improvement, while 2 others recovered with alternative therapy based on the results of sensitivity test. Discussion : Patients were diagnosed as vaginitis gonorrhea based on physical examination and laboratory results. One case was suspected as sexual abuse while the other were suspected of non-sexual abuse such as fomite. The limitation ofthis case report are unidentified sources of gonococcal transmission and rejection for completed STIs screening.*

Keywords: *vaginitis gonorrhea, STIs on children, sexual abuse*

1. INTRODUCTION

Vaginitis gonococcal is the most common form of gonorrhea in children beyond the neonatal period. In contrastto adults, in prepubertal girls the nonestrogenized alkaline vaginal mucosa may be colonized and infected with *N. gonorrhoeae.* The majority of symptomatic children have minor crusting discharge that may discolor the underwear and vaginal pruritus and other signs may be minimal to absent, or they may point to systemic infection. Dysuria and polymorphonuclear leukocytes in the urine may accompany this infection.[1,2] Gonorrhea is transmitted primarily throughsexual contact that most likely to be found at sexually active ages between the ages of 15 to 29 years.[3]

Data on the prevalence of symptomatic gonococcal infection in preadolescent children and early adolescent youths are limited to a few studies and case reports. The most recent prevalence rates of gonococcal infections in an American and a British cohort of sexually abused children were 1.2% and 1.9%, respectively. The incidence rate in Indonesia is not known, Sanglah Hospital in 2007 until 2011 found a total of 224 new cases of gonorrhea (1.7%) of all new cases in the dermatovenereology clinic or about 16.4% of total STI cases, and 3.1% of cases occurred in children aged between 0-15

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years.[2,4] In our Department, this is the 3 of 4 cases of gonorrhea infection in children since the last 5 years.

The Committee on Child Abuse and Neglect of the American Academy of Pediatrics defined child sexual abuseas "when a child is engaged in sexual activities that he or she cannot comprehend, for which the child is developmentally unprepared and cannot give consent, and/or that violate the law or social taboos of society". These sexual activities can include all forms of oral-genital, genital, or anal contact by or to the child and nontouching abuses, such as exhibitionism, voyeurism, or use of the child for the production of pornography.[5] Sexual abuse is the most frequent cause of gonococcal infection in preadolescent children. For preadolescent girls, vaginitis is the most common manifestation of this infection;gonococcal-associated PID after vaginal infection is likely less common in preadolescents than adults.[6]

The literature regarding possible non-sexual transmission through contact with infected household members andfrom towels, bedding and clothing, particularly likely to occur under conditions of over-crowding and poor hygiene, is weaker evidence. It may not be possible to determine whether the infection was spread through sexual abuse or through non-sexual means in household situations. Put together, there is overwhelming evidence that *N. Gonorrhoeae* can be bothsexually and non-sexually transmitted in pre-pubertal children, particularly girls. While international authorities and guidelines acknowledge the rare possibility of non-sexual transmission, their opinions clearly lack the evidence base revealed by this literature review. Fomite transmission may not be acknowledged. Sgroi suggests that the institutional epidemic described by Cooperman of 67 babies acquiring N gonorrhoeae rectally and in their joints while staying in a crowded hospital ward were actually all cases of unrecognised sexual abuse.[7]

2. CASE REPORT

Case 1

We report a 6 year old girl, came to Dr. M. Djamil Hospital Outpatient with (Alloanamnesis with her mother) a yellowish odor vaginal discharge which not felt ichy since 2 weeks ago. Initially 2 week ago, there were yellowish discharge vaginal discharge without painful urination and not accompanied by vaginal itching. Vaginal discharge was yellowish with thick consistency in large quantities which seen at the patient's underwear.

The patient lives with her father, mother and her grandmother. Her father is civil servant and her mother is laboratorian. The patient is a kindergarten student. After school, patients spend more time at home and she rarely playedoutside. But sometimes her mother brought her to the laboratory where her mother works. There were not history of contact sexual or child abuse. The patient often bathes with his mother in the bath-up and There were history of exchangetowels with her mother.

There were no history of lower abdominal pain, urination and defecation. History of redness, blisters, bruises on the genitals and other organs was denied. History of genital wart or genital ulcer was denied. She never got medication for these condition before.

Physical examination revealed normal vital sign, 25 kg weight and general status were also in normal limits. Venereological state was found erythematous vulva with white yellowish vaginal discharge, homogenous in small amount and odorless. There was no hymen perforation.

There was intra-extracellular Gram negative diplococci on vaginal discharge examination with Gram staining withPMN 15-25/HPF (Figure 2). There were not found fungi element, Trichomonas Vaginalis and clue cell on Gram, potassium hydroxide and natrium chlorida examination (figure 1)

We recommended to VDRL, TPHA and HIV examination, consult to psychologist and forensic doctor to the patient, but her mother wants to did a checkup after having insurance.

Based on anamnesis, physical examination, laboratory examination the patient was diagnosed as vaginitisgonorrhoea acute non complicata. Patient got specific treatment with ceftriaxone injection 125 mg intramuscular. After one weeks after therapy, there was no vaginal discharge and there was no diplococci on Gram staining and Thayer Martinculture.

There were history of leukorea in her mother which not feld itchy and not smell in small amounts since 1 month ago. Last intercourse with her husband 1 month ago without condom. History intercourse with the other was denied Physical examination revealed erythematous vulva with yellowish vaginal discharge in large quantities and odorless. There found gram negative bacillus in large quantities and with PMN 30-40/ HPF on stain Gram examination. We diagnosed her mother with servicitis nonspecific and she had improvement 1 week after treatment with azithromycin 500mg twice a day (single dose). History of discharge in her father was not known. Her mother did not tell her husband about this condition to avoiding argue in her family.

Figure 1. There were yellowish vaginal discharge on her underwear (A) There was intra-extracelullar Gram negative diplococci on vaginal discharge examination with Gram staining with PMN 15-25/HSF

Case 2

We reported a 3 year old girl, came to Dr. M. Djamil Hospital Outpatient with chief complaints (Alloanamnesis with her parents) a yellowish odor vaginal discharge which not felt itchy since 6 month ago.

Initially 6 month ago, there were yellowish odor discharge vaginal discharge with painful urination but not itchy. Over the time, the pain of urinating slowly disappeared, but the odor vaginal discharge was still present. Vaginal dischargewas yellowish with thick consistency in large quantities which seen at her underwear. The parents had treated their childto a pediatrician and given her some of drugs (the parents forget name and that doses) but complaints of vaginal dischargedid not improvement. There were no history of lower abdominal pain and defecation. History of redness, blisters, bruises on the genitals and other organs was denied.

The patient is eldest of two siblings and lives with father, mother, grandmother and her cousin. The father is private employees and the mother is housewife. The patient's cousin has a history of sexual abuse at his school before he droppedout from school. The patient's cousin has been living at the patient's home for 9 months and left the house 3 months ago.History of uretral discharge in a patient's cousin is unknown. The parents suspected their 14 year old nephews because they had been found his child in a room with his nephew without clothes, one day before urination pain arises. The examination of the patient's cousin was refused by patient parents and they said didn’t want to have contact with his nephew family.

History of redness, blisters, bruises on the genitals and other organs was denied. History of leukorea in her motherand ureteral discharge on her father was denied. There were history of exchange towels with housemates. History of travelling and stay at hotel, use of public toilets and public swimming pool before discharge was denied.

History of red spots on the body, on both of palms and both of soles on the feet was denied. History of hair loss and local baldness was denied. History of abrasions or ulcers that are not painful and self-healing on her genital previouslywas denied. History of fever previously was denied.

Physical examination revealed normal vital sign, 12 kg weight and general status were also in normal limits. Venereological state revealed hymen intact with white yellowish vaginal discharge, homogenous in small amount and odorless.

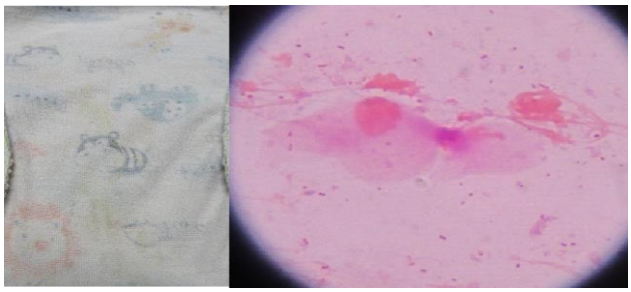

Figure 2. There were yellowish vaginal discharge on her underwear (A) There was extracelullar Gram negative diplococci on vaginal discharge examination with Gram staining with PMN 2-5/HSF

There was extracellular negative Gram diplococci on vaginal discharge examination with Gram staining with PMN 2-5/HPF (Figure 2). There was no found fungi elemen, *Trichomonas vaginalis* and clue cell on potassium hydroxide, Gram and natrium chlorida examination. VDRL, TPHA and HIV examination was non reactive. There was *N. Gonorrhoeae* on Thayer Martin culture.

We recommend to gonorrhea screening all members of the household, consult to Psychologist and Forensic doctor. Patient only visited the Forensic doctor and the reavealed wasn't hymen perforation. Their wasn't revealed diplococci and *N. Gonorrhoeae* from Gram stain and Thayer Martin culture of the vaginal and urethra discharge from both parents. VDRL, TPHA and HIV examination on both parent haven't been done because waiting for insurance.

Based on anamnesis, physical examination, laboratory examination the patient was diagnosed as vaginitis gonorrhoea chronic non complicata. Patient got specific treatment with ceftriaxone injection 125 mg intramuscular. After one weeks after therapy, vaginal discharge was decreased, odorless but there had diplococci extracellular on Gram staining. Cultur and sensitivity test with Thayer Martin revealed *Neisseria Gonorhoeae* which sensitive only with amoxicillin + clavulanic acid. After we treatment with amoxicillin + clavulanic acid 300 mg during 1 month, there was no diplococci on Gram staining and Thayer Martin culture.

Case 3

We reported a girl, 8 years old, came to the dermatology and venereology outpatient clinic with her parents with (Alloanamnesis) yellowish and odor vaginal discharge which not felt ichy recurenly since 11 month ago.

Initially 11 month ago, there were yellowish odor discharge vaginal discharge without painful urination and sometime feel itchy. Vaginal discharge was yellowish with thick consistency in large quantities so that seen at the patient's underwear. The parents had treated their child to Obstetric and Gynecologist given fluconazole 150 mg single dose but complaints of vaginal discharge still appeared. The patient is only child who lives with both parents but sometimes she live in father's family house, there were grandmothers, grandfather and her aunty.

History of leukorea and ureteral discharge on her both parents was denied. History sexual contact was denied. History of redness, blisters, bruises on the genitals and other organs was denied. There were no history of lower abdominal pain, urination and defecation. There were history of exchange towels with housemates, using a public toilet seat on publicswimming pool several times before the onset of vaginal discharge. History of travelling and staying at hotels was denied. History of genital discharge of her both grandparents and her aunt was not known. History of red spots on the body, on both of palms and both of soles on the feet was denied. History of hair loss and local baldness was denied. History of abrasions or ulcers that are not painful and self-healing on her genital previouslywas denied. History of fever previously was denied. History of chronic diarrhea and drastic weight loss previously was denied. History of blood donation or receiving a blood transfusion previously was denied.

Both the patient's parents worked as lawyers, but the patient's parents refused her child referred to Forensic specialist for examination. They feel ashamed and rejected to screening gonorrhea of family members. Examination withGram stain and Thayer Martin culture of the vaginal and urethra discharge from both parents of the patient revealed was not *N. Gonorrhoeae*. VDRL, TPHA and HIV examination were not reactive.

Physical examination revealed normal vital sign, 21 kg weight and general status were also in normal limits. Venereological state revealed hymen intact, erythematous vulva with white yellowish vaginal discharge, homogenous, insmall amount and odorless.

There was extracellular negative Gram diplococci on vaginal discharge examination with Gram staining with PMN 2-5/HPF (Figure 3). There was no found fungi element, Trichomonas vaginalis and clue cell on potassium hydroxide and natrium chlorida examination. Thayer Martin culture was positive for *N. Gonorrhoeae.* VDRL, TPHA and HIV was nonreactive.

Based on anamnesis, physical examination, laboratory examination the patient was diagnosed as vaginitis gonorrhoea chronic non complicata after culture results with Thayer Martin was positive. Patient got specific treatment with twice ceftriaxone injection 125 mg intramuscular because after 1 week therapy vaginal discharge still presented andthere had diplococci extracellular on Gram staining. Culture and sensitivity test still revealed *N. Gonorrhoeae* which sensitive with cefotaxime (+), ceftriaxone (+), gentamicin (+), kanamycin (+).

One week after last therapy, vaginal discharge were decreased, odorless but there had diplococci extracellular on Gram staining. Cultur and sensitivity test with Thayer Martin revealed *N. Gonorrhoeae* which sensitive with gentamicinand kanamycin. One week after we treatment with gentamicin 110 mg (5 mg/w) intramuscular, there was no diplococci on Gram staining and there was no *N. Gonorrhoeae* on Thayer Martin culture.

Figutre 3. There were yellowish vaginal discharge on her underwear (A) There was extracelullar Gram Negative diplococci on vaginal discharge examination with Gram staining with PMN 2-5/HSF

3. DISCUSSION

We report 3 girls with vaginitis gonorrhea based on history, physical examination and routine laboratory tests. All three of these children came with the same complaint that is vaginal discharge that smelled, with and without itchy. The parentsof the all patients found the yellow whitish spots on the underwear of their daughters. There was no history of trauma orabrasions or bruises in these three children. There was no suspicion of sexual abuse on case 1 and 3, but on case 2 wherethe family suspects that his nephew is the perpetrator.

The first patient, there was no history of painful urination and no signs of sexual abuse, but on patient's mother examination, there was a history of vaginal discharge and on Gram stain and Thayer Martin culture examinations showedthat the patient's mother was infected with *N. Gonorrhoeae* and there was a history of changing towels and with her mother. On case two, there was history of sexual abuse with her cousin, one day before urination pain, but the patient's family refused to brought the patient's cousin to the hospital because the patient's cousin had left from her house. On casethree, there was no history of painful urination and no signs of sexual abuse. On examination of the patient's parent, there was a no history of vaginal and ureteral discharge on Gram stain and Thayer Martin culture examinations, but there werehistory used public toilet on swimming pool before vaginal discharge complaining.

Sexual transmission or sexual abuse is the most common cause of gonnorrhea cases in children, but nonsexual transmission may also occur, although rarely and difficult to be scientifically proven. A review of Goodyear (New Zealand, 2007) there are sixty one primary sources of case reports and series of both in vitro and in vivo studies were accessed. There were 36 literature revealed vulvovaginitis with nonsexual transmitted reviewed.[7] Low hygiene and the susceptibility of the prepubertal genitalia allow for the transmission of gonorrhea through direct contact or shared personal hygiene equipment. The public baths, towels, rectal thermometers, and infected caregiver hands can be a source of transmission. A case report in Sydney found the transmission of *N. gonorrhoeae* through a toilet seat to an 8-year-old girl. It was reported that *N. gonorrhoeae* can still grow in culture after 24 hours was allowed to dry in the toilet seat. Although there is still no evidence of transmission naturally can occur from a toilet seat or similar object. *N. gonorrhoeae* are sensitive to heating and will die at 55 ° C for 5 minutes. Gonococcus will also die in dry conditions but may persist in thepus attached to the damp cloth within days. It was found that as long as the pus has not dried, the towel and cloth containingthe pus may

be infectious and become the source of transmission. There was a history of using toilets together without washing hands afterward, washing the genitals with toilet water, swimming and the use of a shared towel that supported the suspicion of nonsexual transmission in this case.[7,8] Indira (Bali, 2019) reported a girl with vulvovaginitis gonococcalwithout sexual violence and no gonococcal infection was found in the family. The transmission is thought to come fromno sexual contact of a close friend of the patient with vaginal discharge complain.[4] The limitations of this case report are exploring the source of infection due to the lack of information from the patient's parents and the reluctance of the patient'sparents to examine other family members living in or in contact with these patient. they think that Gonorrhea in children is considered a disgrace and something that must be covered up. Unfortunately, we didn't found source infection in thesepatient because it is really important to prevention of disease transmission.

Gram staining was examined on all of patients and there were intracellular diplococci on case one and diplococcal extracellular on second and third cases and the result of Thayer Martin culture on all of patients revealed thepresence of *N. gonorrhoeae*. Intracellular Gram negative kidney-shaped diplococci in polymorphonuclear leukocytes, thepresence of which is required for the presumptive diagnosis of gonorrhea. The presence of extracellular Gram-negative diplococci is an equivocal finding that must be confirmed by culture or nucleic acid test.[9] Culture remains the preferred method for diagnosing and detecting infection in specimens obtained from extragenital sites regardless of gender. Gram stains are inadequate for evaluating prepubertal children for gonorrhea and should not be used to diagnose or exclude gonorrhea. The bacterial culture is a gold standard in the diagnostic test of gonococcal infection. Culture specimens in pre-pubertal children are sufficiently taken from the vagina.[2,10]

Diagnosis of vulvovaginitis gonorrhea was made based on anamnesis that found vaginal discharge with other clinical manifestation such as dysuria, vaginal pruritus, lower abdominal pain. On these patients, diagnosis is confirmed by anamnesis, vaginal discharge examination with Gram staining that found diplococcus negative Gram and culture result that found *N. gonorrhoeae*. The treatment of non-complicated gonococcal infections in children <45 kg based on CDC guidelines is ceftriaxone 25-50 mg/kg intravenous (IV) or intramuscular (IM), single dose, a maximum dose of 125 mg. Indonesian Health Ministry recommend a single oral dose as the first choice in the treatment of gonococcal infections. All of this patient we treated with ceftriaxone 125 mg intra muscular. On case one, after 1week therapy, the vaginal discharged was decreased and there were no diplococcus Gram

negative on Gram staining and on Thayer Martin culture. But however, in the second and third patients, vaginal discharge were still present and there were still extracellular Gram-negative diplococci on Gram stain.

According to WHO guidelines for the treatment of *Neisseria gonorrhoeae*, retreatment of gonococcal infections after treatment failure was if treatment failure occurred and resistance data are available, re-treat according to susceptibility.[11] Thayer Martin culture on second patient revealed *N. gonorrhoeae* resistance to ceftriaxon, azitromisin, kanamisin and gentamicin and sensitive only to coamoxyclav. According to cultur and resistency result, the second patient was given coamoxyclav 300 mg 3 times a day (25 mg/kg/day). After 4 weeks therapy, the vaginal discharged was decreased and there weren't found extracellular diplococcus Gram negative on Gram staining and on Thayer Martin culture. Clavulanate has a broad antibacterial spectrum, encompassing both Gram-negative and Gram-positive bacteria and anaerobes, clavulanate is a potent β-lactamase inhibitor which enhance the activity of β-lactam antimicrobials against pathogenic bacteria regardless of whether or not β-lactamase is produced.[12] Clavulanic acid is not present in CDC in thetreatment of gonorrhea but there were research by Lim (Singapore 1984) comparing coamoxiclav with kanamycin for gonorrhea revealed 96% cure by coamoxiclav and 83.3% by kanamycin.[13]

Follow up on third patient, diplococcus Gram negative still positive in Gram stain and Thayer Martin culture. Patient treated injection gentamicin 100 mg IM after twice injection of 125 mg ceftriaxone IM. First and second culture test on patient *N. gonorrhoeae and* sensitive to ceftriaxone, kanamycin and gentamycin, but on third resistency test result sensitive to gentamycin, coamoxyclav, and ciprofloxacin. According to European guideline, gentamicin is an alternativefor ceftriaxone resistant with dose of 5 mg/kgbb.[13] Ross (UK, 2019) comparing gentamicin and ceftriaxone for patients with gonorrhea with conclusion gentamicin is not appropriate as first-line treatment for gonorrhea but remains potentially useful for patients with isolated genital infection, or for patients who are allergic or intolerant to ceftriaxone, or harbour a ceftriaxone-resistant isolate.[14] Gentamicin is used for gonorrhea treatment in several countries, including Malawi. A recent study found continued susceptibility of gonococcal isolates in Malawi after 14 years of use as first-line treatment for urethritis. Gentamicin is an aminoglycoside antibiotic that inhibits protein synthesis by irreversibly binding to 30S ribosomal subunits. The dose used in these studies was usually 240 mg (ranging from 160 mg to 5mg/kg), with no apparent dose response effect across studies and no reported adverse events associated with the drug.

In-vitro susceptibility testing suggests that *N gonorrhoeae* remains susceptible to gentamicin although the in-vivo response and associated susceptibility breakpoints have been poorly characterised.[15]

A child in whom a culture is positive for *N gonorrhoeae* should be examined for the presence of other sexually transmitted diseases such as syphilis, and human immunodeficiency virus infection.[16] In this case, we had thought aboutthat possibility and planned to examine VDRL, TPHA and HIV all of patients and from three cases, two was non reactiveand one patient refused to did the examination.

4. CONCLUSION

Case series of three children with vaginitis gonorrhea was reported. Diagnosis was made based on anamnesis, physical examination and confirmed with Gram staining and Thayer Martin culture as a gold standar. All of patient was treated with ceftriaxone as a first line therapy. Two cases showed resistency toward ceftriaxone, the alternative therapy were given base on culture and sensitivity test. It was difficult to find the exact source of infection in all of patients due to lack of information and denial of further investigations.

Patient consent was obtained

There are a informed consent from the patient.No conflicts of interest/competing interests

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