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ISOLATION AND IDENTIFICATION OF CANDIDA ALBICANS IN THE URINE OF PREGNANT WOMEN AT THE NEGLASARI COMMUNITY HEALTH CENTRE

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ABSTRACT

Candida albicans is one of the major causes of vulvovaginal candidiasis, a common fungal infection among pregnant women due to hormonal changes and decreased immune function during pregnancy. If left untreated, this infection may lead to adverse maternal and fetal health outcomes. This study aimed to determine the presence of *Candida albicans* in the urine of pregnant women at the Neglasari Community Health Center. This study employed a descriptive cross-sectional design. A total of 10 urine samples were collected from pregnant women in the second and third trimesters. Isolation was performed using Sabouraud Dextrose Agar (SDA) medium, followed by microscopic identification using Lactophenol Cotton Blue (LPCB) staining and confirmation with the Germ tube test. Of the 10 urine samples examined, 2 samples (20%) were positive for *Candida albicans*, while 8 samples (80%) were negative. Both positive samples were obtained from pregnant women in the second trimester, whereas no *Candida albicans* was detected in samples from third-trimester pregnant women. *Candida albicans* was detected in 20% of urine samples collected from pregnant women at the Neglasari Community Health Center. Positive cases were found only among second-trimester pregnant women, indicating a higher occurrence in this group than in third-trimester pregnant women.

Keywords "Candida albicans, urine, pregnant women, SDA, germ tube test."

INTRODUCTION

Pregnancy is a crucial process for both mother and baby. There are three stages of pregnancy: the first trimester, which begins at conception and lasts until the end of the third month; the second trimester, which runs from the fourth month to the sixth month of pregnancy; and finally, the third trimester, which spans from the seventh month to the ninth month of pregnancy, leading up to the birth (Wulandari et al., 2022). Pregnancy is characterised by a range of anatomical, physiological, hormonal and psychological changes in the mother's body. One of the most common complaints experienced by pregnant women is vaginal discharge (fluor albus), which can be caused by bacterial, fungal, parasitic or viral infections. According to the World Health Organisation (WHO), vaginal discharge is one of the most common complaints encountered at maternal and child health clinics (KIA). In Indonesia, around 75 per cent of women have experienced vaginal discharge at least once in their lives, and the incidence of this condition increases during pregnancy; it is therefore important for pregnant women (Dewi et al., 2025).

Pregnant women are susceptible to infections that can affect the reproductive system due to a weakened immune system and an increased metabolic rate. Fungal infections and bacterial vaginosis can cause abnormal vaginal discharge. Excessive white discharge from the vagina is known as vaginal discharge (Novianti & Haeriyah, 2021). This is caused by increased levels of the hormones oestrogen and progesterone in the cervix, which lead to vaginal discharge in pregnant women. An increase in mucoid discharge, a whitish colour, and a high number of vaginal epithelial cells are normal during pregnancy. Due to Indonesia's tropical climate, fungi are able to grow rapidly, leading to many cases of vaginal discharge, particularly in pregnant women Data from the SDKI (2021) show that vaginal discharge is caused by several

pathogenic factors, including the fungus Candida albicans, which accounts for 53 per cent of cases, bacteria (40.1 per cent) and Trichomonas (3.1 per cent) in cases of vaginal discharge in pregnant women (Dewi et al., 2025).

Candida albicans is a polymorphic fungus that can exist as part of the normal flora of the human body. It is primarily found on the skin, in the respiratory tract and in the female genital area. Under certain

conditions, this fungus can become an opportunistic pathogen that attaches to epithelial cells and causes fungal infections in individuals with compromised immune systems (Triani et al., 2024). Candidiasis is a medical condition caused by an infection with Candida albicans, which can grow in moist areas of the body such as the mouth, the genitals and the digestive tract. The condition arises due to various factors, such as infrequent changing of underwear, working in wet or damp environments, a lack of attention to personal hygiene, and the effects of the weather (Dewi Tangkelangi, Hartati, 2025).

Research conducted by Rosa (2021) found that at the Midwives' Private Practice (PMB) in Tangerang City, there were 28 pregnant women experiencing vaginal discharge. This condition is associated with a Candida albicans infection (Novianti & Haeriyah, 2021). Putri's study (2021) also found that Candida albicans was present in pregnant women at Pariaman Regional General Hospital, with 5 urine samples from pregnant women (56%) testing positive for Candida albicans, comprising 3 cases in the third trimester and 2 cases in the second trimester (Meli Juliza Putri, 2021). Many pregnant women experience vaginal discharge, and previous studies have found Candida albicans in their urine; therefore, further research is needed to identify the fungus in the urine of pregnant women at the Neglasari Community Health Centre in Tangerang City.

MATERIALS AND METHODS

The study, which investigated the presence of Candida albicans in the urine of pregnant women, was a descriptive study using a cross-sectional design. The study was conducted at the Neglasari Community Health Centre in Tangerang City and took place between January 2026 and May 2026. This data was collected through a combination of secondary data (from brief interviews and medical records) and primary data (from laboratory tests).

The population for this study consisted of pregnant women attending the antenatal clinic at the Neglasari Community Health Centre and The sample used in this study comprised urine specimens from pregnant women in their second and third trimesters who met the following criteria

Criteria :

a) Pregnant women must be willing to participate in the study by signing an informed consent form.
b) Pregnant women in their second and third trimesters of pregnancy.
c) Pregnant women who are willing to have a urine sample taken whilst undergoing a check-up at the Neglasari Community Health Centre, with the assistance of the laboratory department at the Neglasari Community Health Centre.

The equipment: used for examining the urine of pregnant women includes a spirit lamp/Bunsen burner, an inoculating needle, forceps, Petri dishes, test tubes, a test tube rack, an analytical balance, spatulas, measuring cylinders, Erlenmeyer flasks, an autoclave, a centrifuge, microscope slides, cover glasses, syringes, a hot plate, a microscope, an oven, Eppendorf tubes, micropipettes, and various types of micropipettes.

Materials: Urine samples from pregnant women in their second and third trimesters, Sabouraud Dextrose Agar (SDA) culture medium powder, distilled water, serum, and Lactophenol Cotton Blue (LPCB) solution.

A. Pre-analytical

1. Respondents were asked to follow the procedure for collecting a sterile midstream urine sample. Respondents washed their hands, discarded the initial urine stream, and collected the subsequent stream in a sterile, tightly sealable container.
2. Preparation of equipment: This involves cleaning all glassware, which is washed and dried, then sterilised in an oven for two hours at a temperature of approximately 180°C.
3. Weigh out 13.6 grams of Sabouraud Dextrose Agar medium and pour it into an Erlenmeyer flask; add 200 ml of distilled water to the flask. Stir the mixture whilst placing the flask on a hotplate until the powdered medium has dissolved. Add the antibiotic chloramphenicol to the warm medium and stir thoroughly. The medium is then sterilised using an autoclave set to a temperature of 121°C for 15 minutes at a pressure of 1 atm. Once sterilised, the medium is poured into sterilised Petri dishes and left to cool first (Nurasikin, 2024).

B. Analytical The process of urine isolation on SDA medium

1. Place the sample in a centrifuge tube and centrifuge until a sediment forms; collect the sediment using a 1 µl pipette (Priskilia et al., 2024).

2. Then perform the streak plate technique using a 4-quadrant pattern on the medium. This is followed by incubation at 37°C. The final stage of the isolation process is macroscopic observation of the medium; the results are observed as smooth, slippery colonies with a yellowish-white colour and a yeasty odour (Meli Juliza Putri, 2021).

C. Analytical Identification of fungi

1. Macroscopic observation: Macroscopically, Candida albicans growth appears as smooth, slightly raised, yellowish-white colonies on the culture medium (Stikes & Medika, 2023).
2. Microscopic observation: prepare a slide by taking a colony from the SDA medium placing the colony on a microscope slide, Add one drop of LPCB staining solution, and cover with a cover slip and observe under a microscope using magnifications ranging from 10× to 40× (Meli Juliza Putri, 2021).
3. Germ Tube Assay:Add serum to an Eppendorf tube to a volume of 0.5 mL, Pick up a growing colony using a 1µl loop and transfer it into the serum, Then continue the incubation process for 2 hours at 30º C, The next step is to prepare a slide by taking 1 drop of the incubated serum, and The final step is to observe under a microscope at magnifications of 10× to 40× (Meli Juliza Putri, 2021).

D. Post-Analytical

Isolation (Positive/Negative) and Identification of Candida albicans (Positive or Negative) are recorded on the test results form. Results are recorded based on macroscopic (colonies) and microscopic (yeast cells/germ tubes) findings (Ayu Mareta & Indria Anggraini, 2024). The data collected from this study were analysed descriptively and presented in tables and figures. The results of the isolation and identification of Candida albicans are presented in this format.

RESULTS AND DISCUSSION

A. Results Macroscopic results of Sabouraud Dextrose Agar (SDA) culture

Candida albicans was tested via fungal culture. The fungal culture medium used was Sabouraud Dextrose Agar (SDA), with 1 microlitre of urine being collected using a sterile round loop. This was then inoculated onto the surface of the medium using the streaking method. The medium was incubated for 6–7 days at 37°C. As shown in Table 1, the red circles indicate colony growth

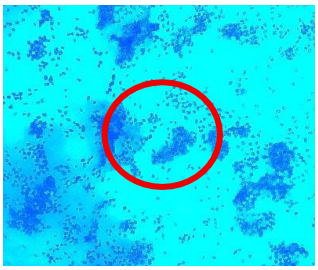
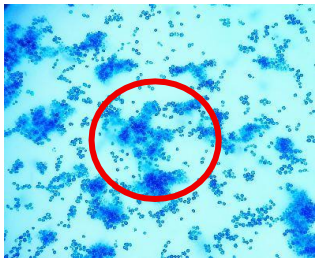
Table 1 Results of Macroscopic Observations on SDA Medium

No	Urine sample from a pregnant woman	Macroscopic examination	Interpretation of results
1.	Ny. RK		Colour: cream Surface: smooth Texture: mucoid Odour: characteristic of yeast
2.	Ny. SYD		Colour: cream Surface: smooth Texture: mucoid Odour: characteristic of yeast

B. Results Microscopic findings following Lactophenol Cotton Blue (LPCB) staining

Microscopic identification was carried out using the Lactophenol Cotton Blue staining method. Fungal colonies were prepared and then placed on a glass slide. A drop of stain was applied to the glass slide and covered with a cover slip. The sample was observed under a microscope using a 40× magnification lens (Indrayati, 2023). In the microscopic observation shown in Table 2, the red circles indicate the presence of numerous blastospores, which are yeast cells that are round, oval or elliptical in shape and small in size.

Table 2 Results of microscopic examination of LPCB staining

No	Urine sample from a pregnant woman	Macroscopic examination	Interpretation of results
1.	Ny. RK		Observations revealed blastopores that were round and oval in shape
2.	Ny. SYD		Observations revealed blastopores that were round and oval in shape

C. Results Microscopic results of the grem tube test

For further investigation, a germ tube test was carried out. The aim was to determine whether Candida albicans and non-Candida albicans fungi differed by incubating serum with Candida colonies for two hours at a temperature of 37º C (Anggun Sophia, 2024) As shown in Table 3, the results of the germ tube test, marked with red circles, revealed germ tubes extending from the yeast parent cells, which visually resembled a racket.

Table 3 Results of the germ tube test

No	Urine sample from a pregnant woman	Macroscopic examination	Interpretation of results
1.	Ny. RK		Positive (+) A germ tube structure was observed, namely a

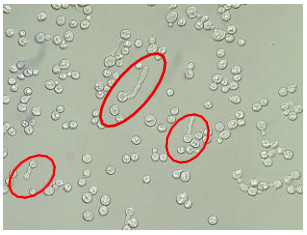
			true hypha growing from a yeast cell (blastospore)
2.	Ny. SYD		Positive (+) A germ tube structure was observed, namely a true hypha growing from a yeast cell (blastospore)

Table 4 Results of the Identification of Candida albicans in the Urine of Pregnant Women by Gestational Age

Gestational Age	***Candida albicans infection***					
	Positive		**Negatif**		**Total**	
	F	**%**	**F**	**%**	**F**	**%**
Trimester II	2	20	3	30	5	50
Trimester III	0	0	5	5	5	50
Jumlah	2		8		10	100

The research results shown in Table 4 indicate that, of the 10 samples from pregnant women examined, 2 samples (20%) from the second trimester tested positive for Candida albicans, whilst the remaining 8 samples (80%) tested negative. In the third-trimester group, no growth of Candida albicans was detected in any of the samples (0%) tested.

D. Discussion

SDA medium consists of peptone and carbohydrates, which provide nitrogen compounds and amino acids for fungal growth, and has a low pH (around 5.6) which naturally inhibits the growth of most contaminating bacteria without affecting the fungi. The fungus Candida albicans will grow on Sabouraud Dextrose Agar (SDA) medium, forming yeast-like colonies with the characteristic features of protruding above the surface of the medium, with a smooth, slippery surface that is yellowish-white to brass-coloured in colour and has a yeast-like odour (Anjas Prayoga, Bastian1, 2023).

Microscopic examination using LPCB staining. This staining is carried out to aid the interpretation of the microscopic images. The phenol in the solution serves to kill the fungi, whilst the lactic acid serves to fix the fungi so that they do not shrink. Cotton blue (Poirrier's blue) acts as a dye that colours the fungi blue (PALEBANG, 2024). Lactophenol Cotton Blue (LPCB) staining is used to identify fungi as it allows details such as hyphae, spores and other structures to be seen (Priskilia et al., 2024).

Germ tube test: a positive result for Candida albicans in the germ tube test will show the presence of blastopores or yeast-like cells forming germ tubes. A false-positive result may occur if the incubation time is too long (i.e. >3 hours), whilst a false-negative result may occur if too much serum is added, leading to a false-negative result (Melia Pratiwi, HartalinaMufidah, Ahdiah Imroatul Muflihah, 2026).

Test results for 10 (ten) urine samples from pregnant women revealed that 2 samples (20%) tested positive for Candida albicans infection, whilst the remaining 8 samples (80%) tested negative. When analysed by stage of pregnancy, all positive samples were found in the second trimester group, comprising 2 out of the 5 samples tested. Conversely, in the third trimester group, no growth of Candida albicans (0%) was detected from the total of 5 samples tested.

The findings of this study are consistent with those of a study conducted by Andrian (2024), which found that Candida albicans was detected in the urine of 20 pregnant women in their second trimester (90.90 per cent) (LARWAKU, 2024). Due to higher levels of emotional stress and increased levels of oestrogen and corticosteroids, which reduce the body's resistance to Candida albicans, this is more common during the second trimester of pregnancy (Priskilia et al., 2024) . Poor personal hygiene and the water used are other factors contributing to an increase in Candida albicans. Poor personal hygiene can facilitate the spread of disease, particularly in the reproductive organs, caused by Candida albicans. Furthermore, the growth of Candida albicans can also be influenced by the use of contaminated or unclean water during daily activities such as bathing, washing and cleaning (Utami et al., 2024)

The results of the research questionnaire administered to pregnant women with Candida albicans infection showed that those in their second trimester experienced clinical symptoms, namely itching in the genital area, during pregnancy. This may be linked to a Candida albicans infection, which causes vulvovaginal candidiasis. states that the clinical manifestations of vulvovaginal candidiasis include vulvar pruritus (itching of the vulva), pain, swelling, redness, a burning sensation, dyspareunia and dysuria. Furthermore, in around 90 per cent of cases of vulvovaginal candidiasis, itching is the most prominent symptom (Levina et al., 2024).

CONCLUSION

The results of the isolation and identification of Candida albicans carried out on urine samples from pregnant women at the Neglasari Community Health Centre indicate that: out of a total of 10 samples examined, 2 samples tested positive for the presence of Candida albicans, equivalent to 20 % of the total samples examined. The study results also showed that the presence of Candida albicans in the urine of pregnant women was identified in those in their second trimester, with two samples testing positive for Candida albicans, whilst in the third trimester, no Candida albicans was detected in the urine samples of pregnant women. For future research, it is hoped that further investigations can be carried out into the presence of bacterial microorganisms in the urine of pregnant women. The wearing of overly tight clothing should be minimised to prevent the vaginal area from becoming damp. Pregnant women are advised to maintain a healthy nutritional status.

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