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Research article

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Potential of Tahongai leaf extracts (Kleinhovia Hospital.) in handling vaginal discharge caused candida albicans: laboratory study

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ABSTRACT

Background

Candida Albicans is the main causative pathogenic microorganism with a recurrence rate of 40-45% causing disruption of the female reproductive organs and conventional discomfort and treatment causing various side effects and resistance. For this reason, it is necessary to conduct research to prove herbal ingredients as a potential alternative treatment in cases of pathological vaginal discharge that are expected to contribute to midwifery services.

Objective

To aim the potential of effective extracts of tahongai leaves able to inhibit candida albicans in vitro, as well as the duration of the inhibitory power of more than 24 hours.

Method

True experimental post-test only control group design, subjects used candida albicans isolates from vaginal patients with the Mc Farland standard suspension 0.5. The inhibitory test uses the disk diffusion method using Fluconazole control.

Results

There are influences of inhibition of various concentrations namely 0.39%, 0.78%, 1.56%, 3.125%, 6.25%, 12.5%, 25%, 50%, 75%, 100% of candida albicans with ANOVA statistical tests ($p_value < 0.05$) The post-hoc test results showed that the concentration of effective extract was 100% with Fluconazole having a inhibition power not different or the same as the p value = 0.999 (> 0.05) because the average strength of the delay was not far adrift. The old ability of extract inhibition also exceeds 24 hours, which is 48 hours with 72 hours indicating the same inhibition power than before. So, the future opportunity to use tahongai leaf extract clinically can be used once a day for vaginal discharge.

Conclusions and Recommendations

The effective 100% concentration of tahongai leaf extract has the potential as an alternative ingredient for vaginal discharge caused by albicans candida. next study preclinical test Potential of tahongai leaf extract Tahongai leaf extract (Kleinhoviahospita L.) to the inhibition of candida albicans with experimental animal subjects. So that the results of research can be applied to humans as an alternative treatment for vaginal discharge in providing midwifery care to reproductive health services for women of childbearing age.

Keywords: Extract, KleinhoviaHospita Linn, Inhibitory Power, Candida Albicans isolates

INTRODUCTION

The Sexually Transmitted Disease Survey in 2016 shows the incidence of sexually transmitted infections 44% of cases aged 15-24 years, 14.7% were infected with candidiasis vaginalis in RSUP Kandou Manado. [1, 2] The most common cause of vaginal discharge is candida albicans at Dr. Kariadi Semarang in 2015 showed 43.33% of the results of vaginal secretions of vaginal discharge patients. [3] Vaginitis candidiasis is one of the causes of vaginal infections in pregnancies that are at risk for third trimester of pregnancy, including bacterial vaginosis and trichomoniasis infection which are associated with discomfort, premature labor, low birth weight, congenital abnormalities and predisposition to HIV / AIDS. [4, 5]

The use of antifungal drugs with Fluconazole for the treatment of infectious diseases caused by candida albicans causes side effects for users such as drug resistance. [6] Thus, the number of cases of infection caused by candida albicans, traditional self-medication, the side effects of chemical drug use, and high maintenance costs need to be carried out research to develop antifungal that are safe from natural ingredients. [7, 8]

STUDY OBJECTIVES

To find out the potential of effective extracts of tahongai leaves able to inhibit candida albicans in

vitro, as well as the duration of the inhibitory power of more than 24 hours.

METHODS

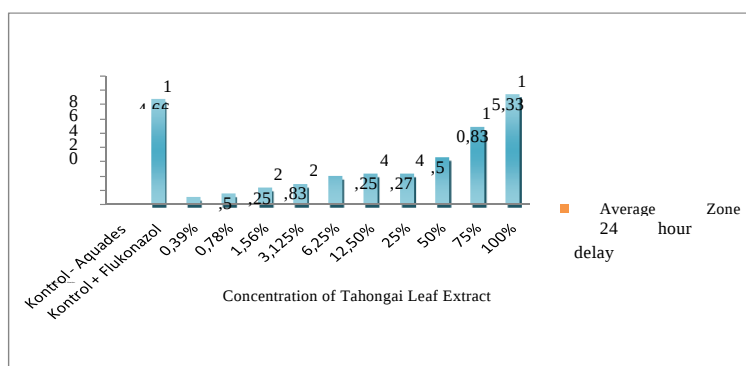
This type of research is a pure laboratory experimental post-only control group design, with a design using 10 treatments, namely Tahongai extract concentration (Kleinhovia hospital linn) 0.39%, 0.78%, 1.56%, 3.125%, 6.25%, 12.5%, 25 %, 50%, 75%, 100%, positive control using Fluconazole and Negative control are aquades. The sample used was suspense according to the McFarland 0.5 standard of isolate candida albicans from vaginal patients in a community health center. [9] The Kirby bauer / disc disk method is used to test the inhibition of candida albicans growth in SDA (sabouroud dextrose agar) by incubating at 37°C, for 24 hours, 48 hours and 72 hours.¹⁰ Then the data obtained were analyzed using ANOVA test. [10, 11]

DATA ANALYSIS

Analysis is carried out *univariate* by calculating the mean of inhibitory power and data normality test and homogeneity which then performed parametric tests to prove the effect of the inhibition power of tahongai (*kleinhoviahospitalinn*) leaf extract on albicans candida. ANOVA statistical test was used to determine the effect and post hoc games howell further testing to determine the significant differences between the treatment groups ($p < 0.05$).

RESULT

Univariate Analysis



(Source: Data Primer, 2018)

Figure 1.1 The average inhibitory power variation is the concentration of Tahongai leaf extract against Candidaalbicans

The above shows that the average inhibition zone of tahongai leaf extract shows the inhibition variation of concentration on the growth of candida albicans in more than 24 hours from the lowest extract concentration of 0.39% to the highest concentration of 100% which indicates an increase in inhibition of Candida albicans. To be more clearly illustrated in the following graph:

Based on graph 1.1 shows that in 24 hours there was the lowest extract concentration at the concentration of 0.39% = 1.00 mm and the highest

inhibition zone was at 100% concentration = 15.33 mm, the treatment of positive control was Fluconazole = 14.66 mm. The picture above illustrates the inhibitory power produced by tahongai leaf extract shows that the greater the concentration of extract, the greater the ability of its inhibitory ability to candida albicans means that the increase in variation in the concentration of tahongai leaf extract is followed by an increase in the average diameter of the inhibitory zone of candida albicans.

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Table 1.2 Post-Hoc Test Results Power Differences Inhibiting Candida albicans growth against Treatment

Perlakuan	Kelompok	Sig.
Flukonazol	Aquades	.000
	Konsentrasi 0.39%	.000
	Konsentrasi 0.78%	.000
	Konsentrasi 1.56%	.000
	Konsentrasi 3.125%	.000
	Konsentrasi 6.25%	.000
	Konsentrasi 12.5%	.000
	Konsentrasi 25%	.000
	Konsentrasi 50%	.000
	Konsentrasi 75%	.256
	Konsentrasi 100%	.999

**Post hoc games howell test*

Based on table 1.2 the results of the post hoc test analysis showed that there were significant differences in the Fluconazole group (control positive) compared to extract concentrations of 0.39%, 0.78%, 1.56%, 3.125%, 6.25%, 12.5%, 25%, 50% with p values <0.05. Fluconazole group (control positive) compared to extract concentration of 75%, and 100% showed p value (> 0.05) meaning that it was not significant or there were no significant differences between groups or the same. There is a non-significant difference in the concentration of extract 100% with Fluconazole because it has an average inhibitory value that is not far or the same means that the effect of the treatment of 100% concentration of tahongai leaf extract is equivalent to Fluconazole.

DISCUSSION

Tahongai(*Kleinhovia hospita* L) Leaf Extract is proven to inhibit fungal growth Candida albicans isolates leucorrhoea. The higher the concentration

of tahongai leaf extract, the higher the inhibitory ability is indicated by the clear zone around the disk in SDA media. The potential of tahongai leaf extract to Mushroom Candida albicans shows that at a concentration of 100% the highest inhibitory power is 15.33 mm and is an effective concentration in inhibiting the growth of albicans candida. The concentration of tahongai leaf extract 100% has the ability to inhibit the growth of albicans candida with the positive control of Fluconazole. In the post hoc test table 1.2 shows that the value of p_value in the extract group is 100% compared to fluconazole = 0.999 (> 0.05) which means there is no significant difference, this is because the mean or strength of the inhibition is not 100% = 15.33 mm and Fluconazole = 14.66 mm. Post hoc test table 1.2, Also shows that pvalue in the concentration group is 75% compared to Fluconazole = 0.256 (> 0.05) which means there is no significant difference and is the minimum concentration for inhibiting albicans candida. Furthermore, in the post hoc test the extract

concentrations were 25%, 6.25%, 3.125%, 1.56%, 0.78%, and 0.39% compared to Fluconazole or positive control showed p value = (<0.05) which means there are significant differences, this is due to the average value the average inhibitory power is between the treatments.

This is in accordance with the hypothesis that tahongai leaf extract can inhibit the albicans candida fungi isolates of whitish patients. The concentration of extracts from the smallest to the highest can cause a zone of inhibition of candida albicans, but the extract concentration of 100% has the same inhibitory ability as Fluconazole and is called effective concentration. Inhibition at 100% concentration showed more similarity with positive control of Fluconazole when viewed from the average value of its inhibitory strength, this was influenced by the high compounds contained in tahongai leaf extract which contained flavonoids, phenols, saponins, alkaloids, and tannins. The ability of the extract is comparable to the positive control in inhibiting the growth of Candida albicans Mushroom so that the tahongai leaf extract has the potential as an alternative material for vaginal discharge caused by albicans candida. The results of the study by Soekamto, et al. (2011) showed that extracts from tahongai plants showed the results of activity tests as an antidoter (candida albicans). The ability of tahongai leaf extract as a potential antifungal agent is because it contains bioactive compounds such as 4.20% Flavonoids, Phenol 4.45%, Saponins 5.08%, Tannin 13.92%, Alkaloid 848.86 μg . [12, 13]

The content of phenolic compounds (flavonoids, tannins, terpenoids, alkaloids) shows the ability to inhibit candida albicans by inhibiting ergosterol in cell membranes thereby inhibiting enzyme function, which makes it a potentially anticandid compound. [14] Tanin compounds, phenols and steroids as anticandides have a minimum kill rate of 25% against candida albicans by fighting

candida albicans biofilm and inhibiting candida albicans through ergosterol membranes and disrupting the morphogenesis of yeast pathways to hyphae. [15]

The content of tahongai leaf extract, which is Alkaloid Compound, contains an alkaline alkaline compound and is present in all parts of the plant[16] Alkaloid compounds have an antifungal role against Candida albicans. [17]

Candida albicans with a inhibitory capacity of 24.7 mm. The mechanism of action of alkaloids is by interfering with the components of the cell's peptidoglycan shrinking so that the cell wall layer is not formed intact because the cell does not contain peptidoglycan.[18] Tahongai leaf extract also contains 13.92% tanin compound which shows a blackish green color that has a role as a pathogenic antimicrobial against candida albicans. Its activity as an antifungal is by coagulating cell wall proteins. Tanin compounds also function to reduce excess fluid in the vagina. [19, 20, 21]

CONCLUSION

The effective concentration of 100% tahongai leaf extract has the potential to be an alternative treatment for vaginal discharge caused by albicans candida.

RECOMMENDATION FUTURE

For further researchers it is recommended to conduct research on isolation and identification of active compounds so that they can be known more specifically compounds or substances that are more acting as antifungals of Tahongai Leaf Extract (Kleinhoviahospita L.). Further research is needed regarding the power test of Tahongai Leaf Extract (KleinhoviahospitaL.) against other microorganisms that cause vaginal discharge.

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