International Journal of Pharmacy and Pharmaceutical Sciences

ISSN- 0975-1491 Vol 9, Issue 5, 2017

Short Communication

CLINICALLY STUDY OF TRANSPARENT SOLID SOAP CONTAINING INDONESIAN PROPOLIS WAX IN THREATED LEUKORRHEA CAUSED BY *CANDIDA ALBICANS*

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Received: 26 Aug 2016 Revised and Accepted: 09 Mar 2017

ABSTRACT

Objective: *Candida albicans* (CA) is one of leading cause leukorrhea due to microbial infection. Propolis wax is a fraction of propolis, and thus its remains as the side product of refined propolis are sufficient to inhibit CA, *Pseudomonas aeruginosa, Staphylococcus aureus*, and *Streptococcus mutans* growth. In this study, we used transparent solid soap containing Indonesian propolis wax to treated patients with leukorrhea disease.

Methods: Quasi-Experimental designs that use for the Pre-Experimental design one group pretest-posttest design with a control group who performed on patients with leukorrhea in January 2014 in Tasikmalaya (West Java, Indonesia) district health center by using statistical analysis of T Test Dependent. The study conducted on 36 patients with leukorrhea and positively infected by CA. The transparent soap containing propolis wax 1% and 2% are used for to group I (20 respondents) and group II (10 respondents), and six respondents used as the negative control group.

Results: The results showed that both groups could treat by the soap. The soap significantly effective in decreasing the number of CA, while six respondents in the control group showed a significant in increasing the number of CA. The results revealed that the content of propolis wax 1% and 2% in the preparation of transparent soap significantly influence on the subtraction of the number of patients with CA leukorrhea.

Conclusion: The results obtained in this research work clearly indicated that the transparent soap containing propolis wax 1% and 2% have a potency to against leucorrhea disease caused by CA.

Keywords: Leukorrhea, Propolis wax, Candidiasis, Bar transparent soap

DOI: http://dx.doi.org/10.22159/ijpps.2017v9i5.14907

About 75% of Indonesian women have experienced leukorrhea at least one time in her life, more than 70% of them caused by fungi, bacteria, and amoeba. It contrasts with European which only 25% are due to the humid weather in Indonesia caused easily infected by the fungus *Candida albicans* (CA), which is one cause of leukorrhea [1-3].

Pathologically, leukorrhea caused by microbial infections, especially if occur in pregnant women. It causes premature neonate who is still a cause of high morbidity and mortality rate of newborns [4]. In general, the incidences of a preterm infant in Indonesia increase from 6% reach to 10%. It is related to the immaturity of organs such as the lungs, brain and gastrointestinal tract of premature infants. If leukorrhea occurs during pregnancy, then it is fitting requires a physical examination and adequate support to be risk experienced by the mother and or fetus [4].

Leukorrhea treatment with propolis as one of the types of non-pharmacological management is a good solution in the face of events leukorrhea [5]. Propolis produced from herbal therapy animal bees. Propolis is bioactive contained in honey bee hives that contain polyphenols and flavonoids which have anti-inflammatory activity, antiviral, antioxidant, antibacterial, and anti-parasitic. Propolis is composed of 45-55% resin, wax, and 25-35% fatty acids, 10% essential oils, 5% pollen, minerals, and vitamins as well as other organic substances 5% [6-13].

Propolis wax is the side product when in the process of propolis extraction. Propolis wax in the preparation of transparent soap has excellent antimicrobial activity, particularly against CA, and three strains of pathogenic bacteria, namely *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Streptococcus mutans*. Propolis wax also has much useful content of polyphenols as antioxidants so that the resulting soap is more durable and not rancid. In this study, we performed a clinical study of the propolis wax in the solid soap in the ability to treat leukorrhea caused by CA.

The transparent solid soap for this study, prepared by Nano Biotek Indonesia Inc. The soap used in this experiment divides into two groups, containing 1 and 2 % Indonesian propolis wax. Quasi-experimental designs that use the pre-experimental design one group pretest-posttest design with a control group of patients who performed leukorrhea in Tasikmalaya district health center by using statistical analysis of T-test dependent.

To analysis the effect of propolis wax soap, the object was divided into three (3) groups, group I is the respondents who treated by propolis wax 1% (20 respondents), group II by 2% (10 respondents) and group III is control group (6 respondents). The experiment was initiated by taking the sample of vulva discharge (fluid of leukorrhea) from all respondents and analyzed the present of CA. Only the active infected by CA respondents were selected. After 7 (seven) days treatment by the transparent soap, the vulva discharge was analyzed again.

The data were analyzed in the form of CA in the field of view (FV). The initial phase of the statistical analysis performed for further Normality Test Dependent t-test as a significant effort to determine the influence of the propolis wax to leukorrhea. The correlation test conducted to determine the effect on the comparison between treatment groups 1% and 2%.

From the table 1, it showed that the age of the youngest respondents is in the age group 21-25 y amounted to four people (11 %), while the older in the age group 45-50 y are two people (5 %). The numbers of respondents are most numerous in the age group 31-35 y were ten persons (27 %).

Table 1: Respondents age distributions

Age	Amount of respondents	Percentage
21–25	4	11%
26–30	4	11%
31–35	10	27%
36–40	9	24%
41–45	8	22%
46–50	2	5%
Total	37	100%

Table 2 shown that the low educated respondents are three (3) people (8.11%) and the graduate from university are 2 (two) people (5.41%). Meanwhile, the majority of respondents as a Housewife are 30 respondents (81.08%). Symptoms most often occur in respondents with this leukorrhea is vulva discharge that is watery, while the least pain symptom. Only sixteen people (43.24%) of respondents who likes to consult a health facility while suffering from leukorrhea.

The result showed that the distribution data against the respondent with the provision of propolis wax treatment 1% seen that all colony of CA decreased after they treated by the soap (see fig. 1). The largest decreasing occurred in the number of CA premises respondent's 17.5/FV (per field of view). All respondents with some 20 people (100%) in this group experienced a decrease in the number of CA after 7 (seven) days of treatment. A similar case of group II, it appears that all of the CA decreased after administration of propolis wax treated 2%. The largest decline occurred in two people premises number of CA respondents 17.5/FV (per field of view). From the number of 10 respondents in the group treatment propolis wax 2%, about 9 (nine) people (90%) decrease in the number of CA after seven (7) days treatment. There was one respondent (10%) who did not experience a decrease or increase in the number of CA (see fig. 1).

Data distribution from laboratory test results against control groups of respondents (without treatment) it is shown that all respondents experienced changes in the number, it increased in the number of CA. Very different from that of the respondents who received treatment.

Table 2: Distribution of respondents by education and employment

Education			Occupation		
Level of education	**Amount**	**%**	**Kinds of occupation**	**Amount**	**%**
No school	3	8.11	Housewife	30	81.08
Elementary school	6	16.22	Private company	1	2.70
Junior high school	8	21.62	No work	1	2.70
Senior high school	18	48.65	Government employee	1	2.70
University	2	5.41	Entrepreneur	4	10.81
Total	37	100	Total	37	100

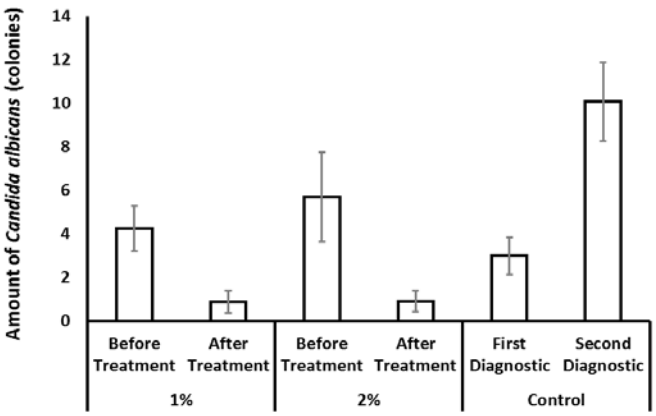

Fig. 1: The results of the propolis soap treatment and control. To compare CA inhibition activity of the wax propolis, the respondents divide into three groups, a group I which treated by the soap contain 1% wax propolis (n = 20), group II which treated by the soap contain 2% wax propolis (n= 10) and negative control (n=6). Each point represents the mean±SEM (p<0.05)

The test T-dependent treatment of group 1% showed that average number of CA for the first measurement was 4.825 per FV with a standard deviation of 4.6291 per FV. At the second measurement obtained an average number of CA is 0.875 per FV with a standard deviation of 2.3163 per FV. Looks mean value of the difference between the first and the second measurement was 3.950 with a standard deviation of 3.6667.

The results of statistical tests with variable data with the results of the transformation of data obtained formed substantial positive skewness value of 0.000 (P value<α), we can conclude there is a significant difference between the number of CA first and second measurements. It can be concluded that the results of the statistical test T test dependent data processing program using SPSS version 2.0 were used showed that the null hypothesis (Ho) Rejected. It means the provision of propolis wax 1% in the preparation of transparent soap significant influence treat or decreases the number of CA.

The test T-dependent treatment group 2% showed that average number of CA the first measurement was 5.700 per FV with a standard deviation of 6.4601 per FV At the second measurement obtained an average number of CA. is 0.900 per FV with a standard deviation of 1.5239 per FV. Looks mean value of the difference between the first and the second measurement is 4.8000 with a

standard deviation of 6.8240. The results of statistical tests with variable data with the results of the transformation of data obtained from substantial positive skewness value of 0.041 (P value<α), we can conclude there is a significant difference between the number of CA. First and second measurements. It also can be concluded that the results of the statistical test T test dependent data processing program using SPSS version 2.0 were used showed that the null hypothesis (Ho) rejected. It means the provision of propolis wax 1% in the preparation of transparent soap significant influence treat or decreases the number of CA.

Test T-dependent control group showed the average number of CA; the measurement was 3.500 per FV with a standard deviation of 2.0976 per FV At the second measurement obtained an average number of CA is 10.083 per FV with a standard deviation of 4.4432 per FV. Looks mean value of the difference between the first and the second measurement is 6.5833 with a standard deviation of 2.4782. The results of statistical tests with variable data with the results of the transformation of data obtained from substantial positive skewness value of 0.001 (P value<α), we can conclude there is a significant difference between the number of CA first and second measurements. It reinforces the above conclusions on propolis wax treatment groups in the preparation of transparent soap effect on the decrease in the number of CA in patients with leukorrhea as in the control group showed any increase or growth of CA significantly increased when given no treatment.

Because both lead to the conclusion any significant influence on the amount of CA decreased both the treatment group and propolis wax 1% in the treatment group propolis wax 2%, it would require further conclusions; which of the two levels is the best or most influential.

A correlation test was conducted to determine the answer to the above question. The test results showed that the differences in the content of propolis wax on transparent soap not significant (P value<α). A Linear relationship between the second and degrees are base on the value of r (r =-0.277).

The conclusion of this test is the use of transparent soap with propolis wax content of 1% or 2% propolis wax is equally effective in reducing the number of CA in patients with leukorrhea but do not give significantly different effect.

The research of new antibiotics for CA recently increased. It because some antibiotics have lost their effectiveness, one of the new antibiotics for CA is the extract from *Wrigitia tinctoria* (Roxb.) R. Br. and *Croton roxburghii* [14, 15]. The extract of *W. tinctoria* (Roxb.) R. Br. and *C. roxburghii* showed the minimum inhibitory concentration of 512 µg/ml and 1.25 mg/ml, respectively [14, 15]. Propolis extract also has antibiotics activity for CA. However, it was *in vitro* study, the *in vivo* study for leukorrhea diseases still limited. Mousavi *et al.* study showed that the extract propolis could treat by vaginal cream contained propolis. The results showed that 68% of patients significantly reduce the number of *Candida* [6]. Our study by using propolis wax 1 and 2% in the form of transparent soap more effective compare the cream form. It is suggested that propolis wax more efficient compared with ethanol extract propolis or soap form more effective compare with cream form.

It was the first time of clinical study of the propolis in against leukorrhea caused by CA. The results showed Indonesian propolis wax contained in transparent solid soap useful in against CA causing leukorrhea. The 1 and 2% of propolis wax in the propolis soap could inhibit CA significantly.

ABBREVIATION

CD, *Candida albicans*; SD, Standard deviation; SE, standard error; P value, Probability value; N, normality; FV, field of view

ACKNOWLEDGMENT

The authors thank abigail of the Universitas Indonesia for soap preparation.

The work reported here is a part of the support program for improving the community engagement from Indonesian Science Institute in the "Technology transfer for producing healthy soap containing propolis" which is financially supported by Indonesian Science Institute 2014-Indonesia through Universitas Indonesia.

MS contributed as the project leader, analysis the data, writing articles, and also prepared propolis wax and transparent solid soap. ER contributed on clinically analysis on leucorrhea patients.

CONFLICT OF INTERESTS

The authors have no conflict of interest

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How to cite this article

- Muhamad Sahlan, Etin Rohmatin. Clinically study of transparent solid soap containing Indonesian propolis wax in threated leukorrhea caused by *Candida albicans*. Int J Pharm Pharm Sci 2017;9(5):275-277.