

The Difference of Number Colonies of Lactic Acid Bacteria and *Candida albicans* on the Cyclofem Contraceptive Injections with Depot Medroxyprogesterone Acetate

Novi Maya Sari¹, Netti Suharti², Arni Amir¹

¹Master of Midwifery Program, Faculty of Medicine, Universitas Andalas, Padang City, Indonesia

²Department of Microbiology, Faculty of Medicine, Universitas Andalas, Padang City, Indonesia

Corresponding Author: Novi Maya Sari

ABSTRACT

Introduction: The aim of this study was to determine the number colonies of Lactic Acid Bacteria (LAB) and *Candida albicans* on the Cyclofem contraceptive injections with Depot Medroxyprogesterone Acetate (DMPA).

Methods: This study conducted cross-sectional study design, this research was conducted in the work area of the Belimbing Health Center and Microbiological Laboratory of the Faculty of Medicine Andalas University, Padang from May 2017 - April 2018. There were 48 samples selected by consecutive sampling, which were divided into 2 groups: 24 DMPA contraception acceptors and 24 cyclofem contraception acceptors. Numbers of LAB and *Candida albicans* colonies were examined by the Quebec Colony Counter Forming Unit method.

Results: The results of the mean BAL colonies in the DMPA group were $24,94 \pm 24,25 \times 10^5$ CFU / ml and the cyclofem was $15,00 \pm 27,08 \times 10^5$ CFU / ml. Statistically obtained p value <0.05 meant that there was a significant difference in lactic acid bacteria (LAB) colonies between DMPA and cyclofem groups. The mean colonies of *Candida albicans* in the DMPA group were 1.25 ± 3.52 CFU / ml and the cyclofem was 0.75 ± 3.09 CFU / ml. Statistically, $p > 0.05$ meant that there was no significant difference between the colonies of *Candida albicans* in the DMPA and cyclofem groups. Conclusion: This study concluded that there was no significant differences between cyclofem and DMPA contraception groups with the incidence of *Candida albicans* infection.

Keywords: *Candida albicans*, Cyclofem; DMPA; Hormonal contraception; Lactic acid bacteria

INTRODUCTION

Hormonal contraception is a type of contraceptive that is effective in preventing pregnancy. This can be seen from the increasing number of hormonal contraceptive acceptors from year to year. In Indonesia, the types of injectable contraceptives and pills are the 2 most contraceptive choices. Counting from 35,795,560 active acceptors in Indonesia, 17,104,340 (47.78%) were injectable

acceptors and 8,447,972 (23.6%) were pill acceptors. ^[1]

Ironically, behind the effectiveness of hormonal contraception, there are a number of negative effects, especially if used for a long time. Hormonal contraception that contains estrogen and progesterone can result in increased glycogen levels in the vaginal epithelium which stimulates the growth of Lactic Acid Bacteria (LAB). ^[2]

LAB maintains an acidic atmosphere in the vagina, by changing the glycogen contained in the vaginal epithelium to lactate. Under normal circumstances the vaginal secretion pH ranges from 3.8 to 4.5. This low degree of acidity due to the production of lactic acid is beneficial to the body's defense system because it prevents colonization of bacteria and fungi such as *C. albicans*. [3]

In a large colonies number of LAB that can cause the production of lactic acid from the metabolism of the LAB colonies so that it can reduce vaginal pH. Too acidic vaginal pH will reduce bacterial activity but is beneficial for the growth of *C. albicans*. Glycogen is also a source of nutrients that is beneficial for the growth of *C. albicans*. [4]

C. albicans causes candidiasis vulvovaginalis is one infection that often occurs when there is a shift in the dominance of the genital tract flora, predominantly LAB, replaced by *C. albicans*. LAB produces H₂O₂ which maintains vaginal pH in an acidic state thereby preventing the development of other bacteria, with a shift in the dominance of the flora in the vagina. This microbiological change causes biochemical changes in the form of increased vaginal pH and increased levels of endotoxin, sialidase enzymes and bacterial glucosidase found in vaginal fluid. [3]

The impact of candidiasis infection is very detrimental to health and especially the quality of life of women. Patients will experience vulvar pruritus, dysuria, erythema, and dyspareunia. *Candida sp* infection also results in uncomfortable sex and increases the risk of transmission of other reproductive tract infections such as HIV AIDS. [4,5]

MATERIALS & METHODS

Study Design and Research Sample

This study was an observational study with a cross-sectional study design conducted at 24 acceptors of cyclophemes and 24 DMPA acetate acceptors in the working area of Belimbing Primary Health

Care, Padang City, Indonesia in May 2017 to April 2018. The method of sampling was done by non probability sampling by consecutive sampling.

Operational Definitions

The variables of this study included independent variables: number of LAB colonies and *Candida albicans* on the cyclofem contraceptive injections dependent variable is Depot Medroxyprogesterone Acetate.

Data Collection Technique

This study was approved by the Ethical Committee of Medical Faculty, Universitas Andalas with registration number 495/KEP/FK/2017.

Data Analysis

The quantitative variables were recorded as mean and standar deviation. Hypothesis test used mann-whitney test. A two-tailed *P*-value of <0.05 was considered statistically significant. Data were analyzed using the SPSS program.

RESULT

Mean of LAB and *Candida albicans* (Table 1).

Table 1: Mean of LAB and *Candida albicans*

Variables	Mean ± SD
LAB	19,97 ± 25,92 x 10 ⁵ CFU/ml
<i>Candida albicans</i>	1,00 ± 3,56 CFU/ml

Table 1 known the mean of LAB level was higher (19.97 ± 25.92 x 10⁵ CFU / ml) than the level of *C. albicans* (1.00 ± 3.56 CFU / ml).

Table 2: The difference of number colonies of LAB on the Cyclofem contraceptive injections with Depot Medroxyprogesterone Acetate

Variables	LAB (CFU/ml)			p value
	n	Mean ± SD (10 ⁵)	Mean ± SD (Log 10)	
Cyclofem	24	15,00 ± 27,08	3,63 ± 2,97	0,010
DMPA	24	24,94 ± 24,25	5,97 ± 0,81	

Table 2 known the mean of LAB colonies were higher in the DMPA group than in the cyclofem group. The mean of LAB colonies in the DMPA group were 24.94 ± 24.25 x 10⁵ CFU/ml and the cyclofem was 15.00 ± 27.08 x 10⁵ CFU/ml. Statistically there

were significant differences between the two groups.

Table 3: The difference of *Candida Albicans* colonies on cyclofem injection contraception with DMPA

Variables	<i>Candida albicans</i> (CFU/ml)		p value
	n	Mean \pm SD	
Cyclofem	24	0,75 \pm 3,09	0,399
DMPA	24	1,25 \pm 3,52	

Table 3 known mean of *C. Albicans* colonies were higher in the DMPA group than in the cyclofem group. The mean DMPA group was 1.25 ± 3.52 CFU/ml and the cyclofem was 0.75 ± 3.09 CFU/ml. Statistically there were no significant differences between the two groups.

The study also found that the mean of *Candida albicans* colonies were higher in the DMPA group than in the cyclofem group. The mean DMPA group was 1.25 ± 3.52 CFU/ml and the cyclofem was 0.75 ± 3.09 CFU/ml. Statistically there were no significant differences between the two groups.

DISCUSSION

The results of study known there was no significant differences between cyclofem and DMPA contraception groups with the incidence of *Candida albicans* infection. Based on the theory that has been stated that estrogen hormone levels in cyclofem injection contraception causes rapid growth of Lactobasillus bacteria and makes the environment acidic, environmental effects that are too acidic cause vaginal pH to decrease, this can cause a decrease in the number of LAB colonies in the vagina, so that with this environment causes *Candida albicans* to thrive in the vagina. In addition, the cyclofem contains progesterone which can stimulate glucose storage as glycogen. Glycogen is converted into lactic acid so that the environment becomes more acidic, the acidic environment causes LAB to decrease and *Candida albicans* can thrive.

In this study it was found that the number of *Candida albicans* colonies was higher in DMPA contraceptive use and the statistical test showed no significant

differences. Judging from the number of colonies of *Candida albicans* in the DMPA group obtained 1.25 ± 3.52 CFU/ml, the number of colonies is still within the normal range, so it does not affect the risk of infection. On the results of the LAB examination it was found that the number of LAB colonies was higher in the use of DMPA, if associated with the existing theory this study was not in line or contradictory. In theory, if a high LAB colony is found, then there will be a low number of *Candida albicans* colonies. The increase or decrease in the number of LAB colonies and *Candida albicans* in the use of DMPA contraception, not only caused by hormones, but also influenced by other factors, such as bad sexual behavior, transmission of infection from sex partners, warm and moist environmental influences, use tight underwear, use of vaginal cleansers, and personal hygiene.

The significance of the cyclofem injection and DMPA contraceptive relationships was not significant. Overall, contraceptive factors are not proven to have a significant relationship to the growth of *Candida albicans*.^[6]

The conclusion of this study is that there are significant differences between acceptors of injection cyclofem and DMPA contraceptives with the number of LAB. Unlike the *Candida albicans* colonies there was no significant difference between the Cyclofem and DMPA injectable contraceptive acceptors with *Candida albicans* Colonies so that it could be concluded that there was no significant difference between cyclofem and DMPA contraceptive use with the occurrence of *Candida albicans*.

CONCLUSION

The conclusion of this study confirmed there were no significant differences between cyclofem and DMPA contraception groups with the incidence of *Candida albicans* infection.

REFERENCES

1. Ministry of Health Republic of Indonesia. Basic Health Research Data in Indonesia. Jakarta: Ministry of Health Republic of Indonesia; 2017.
2. Sulistyawati A. Family planning services. Jakarta: Salemba Medika; 2011.
3. Emeribe AU, Nasir IA, Loveth A, Ifunaya. Prevalence of vulvovaginal candidiasis among nonpregnant women attending a tertiary health care facility in Abuja, Nigeria. *Research and Reports in Tropical Medicine*. 2015; 2015: 37-42.
4. Yusuf MA, Chowdhury MAQ, Sattar ANI, Rahman MM. Evaluation of the Effect of Contraceptives on Prevalence of Candida Species on Vaginal Candidiasis in Dhaka, Bangladesh. *Bangladesh J Med Microbiol*. 2007; 1(2): 61-64.
5. Enweani IB, Gugnani HC, Okobia R, Ojo SB. Effect of contraceptives on the prevalence of vaginal colonization with Candida species in Edo State, Nigeria. *Rev Iberoam Micol* 2001; 18: 171-173.
6. McClelland RS, Richardson BA, Hassan WM, et al. Prospective Study of Vaginal Bacterial Flora and Other Risk Factors for Vulvovaginal Candidiasis. *J Infect Dis*. 2009; 199(12): 1883-90.

How to cite this article: Sari NM, Suharti N, Amir A. The difference of number colonies of lactic acid bacteria and candida albicans on the cyclofem contraceptive injections with depot medroxyprogesterone acetate. *International Journal of Research and Review*. 2019; 6(5):195-198.
