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The Effectiveness of Misoprostol Single Dose Oral for Evacuation of Incomplete Abortion

Efektifitas Penggunaan Misoprostol Dosis Tunggal Peroral untuk Evakuasi Abortus Inkomplit

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ABSTRACT

This study is aimed to find out the effectiveness of oral 600 mcg single dose misoprostol for the evacuation of conception remnant in cases of incomplete abortion. This research is done by quasi experimental method with one group pretest – posttest design. The population of the study is all women who were diagnosed with incomplete abortion in less than 12 weeks of gestation in Cipto Mangunkusumo National general Hospital and affiliations hospital from June 2018 to June 2019. Women who met the study criteria, was treated with oral misoprostol 600 mcg single dose and then undergo conception evacuation evaluation and side effects evaluation. Effectiveness evaluation was seen after 7 days of single dose 600 mcg of misoprostol by measuring <15 mm endometrial thickness on transvaginal ultrasound. The effectiveness of using single dose oral misoprostol 600 mcg in the study participants was 93.55%, which were 29 out of a total of 31 participants. The side effects experienced after being given misoprostol were bleeding with less than the same amount as menstruation (71.0% and 9.0%), diarrhea (6.5%), and shivering (67.7%), and not found side effects of vomiting. Based on data analysis using paired T test before and 24 hours after administration of misoprostol, there was a significant difference between endometrial thickness (p value <0.001). Misoprostol 600 mcg per oral dose is effective for the evacuation of retained conception tissue of incomplete abortion at less than 12 weeks gestation, so that it can be an alternative non-operative method of evacuating retained conception tissue in incomplete abortion cases other than the operative method. Side effects found were bleeding, diarrhea, and chills. Side effects of vomiting were not found in this study.

***Key words**: effectiveness, incomplete abortion, misoprostol.*

Introduction

Abortion is a situation where conception tissues are expelled out of the womb before it is viable, which is less than 500 grams or less than 20 weeks of gestational age (Cunningham et al., 2014). It is known that about 30%-40% of pregnancy results in an abortion, whether known or unknown. In the whole world, there were 40-70 cases of abortion per 1000 productive females. The frequency of abortion increases by 12% in females less than 20 years of age, and increases up to 50% in females more than 40 years of age (Seifert and Altman, 2015). The classification of abortion is the basis of its treatment, where in incomplete abortion, its treatment consists of stabilizing hemodynamic status and evacuation of retained conception tissue. This evacuation can be done by expectative management, pharmacologic, of non-pharmacologic. Misoprostol is well known by several researches as a safe and effective agent for evacuating retained conception tissue (Cunningham et al., 2014). According to International Federation of Gynecology and Obstetrics (FIGO) and WHO in 2017, the effective dose for incomplete abortion is 600 mcg orally (FIGO, 2017). Several researchers, Paritakul and Phupong (2010), Diop and colleagues (2009), Nguyen and colleagues (2004), Weeks and colleagues (2005), and Shwakerela and colleagues (2007), Dao and colleagues (2007), and Bique and colleagues (2007) reports that using oral 600 mcg misoprostol for the evacuation of retained conception tissue of incomplete abortion is relatively an effective method.

This research is aimed to know the effectiveness of oral 600 mcg single dose misoprostol in evacuating incomplete abortion conception tissue in gestations less than 12 weeks of age. This research will also take note of any side effects of misoprostol and whether there is a difference of the endometrial thickness before and 24 hours after the administration of misoprostol.

Materials and Methods

This research was carried out after obtaining the Faculty of Medicine-*Universitas Indonesia* ethics committee's approval (Number: 1248/UN2.F1/ETIK/2018) and research permission from Koja District Hospital and Karawang District Hospital. This research was done by quasi experimental method with one group pretest – posttest design. The population of the study was all females who were diagnosed with incomplete abortion in less than 12 weeks of gestation in Cipto Mangunkusumo National Central Hospital and its networks (Koja District Hospital and Karawang District Hospital) from June 2018 to June 2019.

The inclusion criterias of this research were all females that present with failure of pregnancy and diagnosed with incomplete abortion less than 12 weeks of gestational age. The exclusion criterias were the presence of molar or ectopic pregnancy, the presence of hemostasis imbalance, the presence of cardiovascular or other vascular disease,

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the presence of intrauterine infection, indwelling intrauterine device, allergies to misoprostol or any other prostaglandin analog, and participants that were hemodynamically unstable.

Participants were selected consecutively and were given information about their participation in the study that consists of information about the purpose of this study, incomplete abortion, misoprostol, and side effects that may appear. Data were collected primarily on participant's characteristics, hemodynamic status, and endometrial thickness from transvaginal ultrasound in the beginning. Misoprostol 600 mcg were given orally. Participants were observed for 24 hours in the patient ward, and underwent transvaginal ultrasound before being discharged. Participants were scheduled for control in 7 days after the administration of misoprostol to the gynecology clinic, where participants once again were evaluated by transvaginal ultrasound to measure the endometrial thickness.

This study's validity may be questioned for it does not meet the minimum sample count, but it satisfies the theory that an experimental research must meet at least 30 samples. This lack of sample is possible because the lack of incomplete abortion cases that meets this research's criteria, and there are some patients who did not give their consent.

Results and Discussion

There were 31 participants in this study that were admitted for incomplete abortion that satisfied the inclusion and exclusion criteria. The participant's characteristics by age group, formal education, occupation, parity, and gestational age can be seen on Table 1.

This research found that the frequency of incomplete abortion is at its peak in the age above 30 years. This finding is consistent with the research done by Xiaobin and colleagues in 2018, that mentions that age above 30 years old has the highest risk to abortion (Xiaobin et al., 2018). While research by Putri (2018) found the samples were dominated by age of 20-35 years old. Spontaneous abortion is found in lower education levels (high school and lower), which are consistent with the findings by Zheng and colleagues in 2017. This study also finds that the frequency of spontaneous abortions are lower in working females, which is also consistent with this research's findings, which collected data from 84,531 women in China (Zheng et al., 2017). Xiaobin and colleagues (2018) and Pitriani (2013) found in their study that incomplete abortions rise in risk in lower parities, which are consistent with the findings of this study, where nullipara and low multipara has the highest rates of incomplete abortion (29.0% and 58.1%). There is no data found regarding the distribution if gestational age in incomplete abortions occurring in less than 12 weeks of gestational age.

Table 1. Participant's characteristics distribution (n=31)

Characteristics	Category	Frequency	Percentage (%)
Age Group	< 20 years	2	6.5
	20-30 years	13	41.9
	> 30 years	16	51.6
Formal Education	Lower education levels (high school and lower)	26	83.8
	Academy and higher	5	16.1
Occupation	Working women	13	41.9
	Non working women	18	58.1
Parity	Nullipara (Gravida 1)	9	29.0
	Low multipara (Gravida 2-4)	18	58.1
	Grande multipara (≥Gravida5)	4	12.9
Gestational Age	< 8 weeks	10	32.3
	8-12 weeks	21	67.7

Table 2. Effectivity of oral 600 mcg single dose misoprostol (n=31)

Category	Frequency	Percentage (%)
Successful (≤ 15 mm)	29	93.55
Failed (> 15 mm)	2	6.45

Table 3. Effectivity of oral 600 mcg single dose misoprostol based on gestational age (n=31)

		Evacuation	
		Successful	**Failed**
Gestational Age	< 8 weeks	8 (80.0%)	2 (20.0%)
	8-12 weeks	21 (100.0%)	0 (0.0%)

This research finds that the effectiveness of oral 600 mcg single dose misoprostol for the evacuation of incomplete abortion retained products of conception is 93.55% (Table 2), for it succeeded in evacuating 29 out of 31 participants successfully. This finding is consistent with the researches of Paritakul and Phupong, even though they found lower success rate of 87.5%. They found a lower success rate maybe because they evaluated the success rate in 2x24 hours, whereas this research done in 7 days (Paritakul and Phupong, 2010). Several other researches by Nguyen and colleagues (2005), Weeks

and colleagues (2005), Shwekerela and colleagues (2007), Dao and colleagues (2007), and Bique and colleagues (2007) found similar success rate that ranges through 91.0% and 99%.

Table 3 shows the success rate after adjustments based on gestational age. It was found that there are 2 participants that failed the misoprostol treatment, which belong to the gestational age group of less than 8 weeks. It is inconsistent with the findings of Zikopoulos and colleagues (2002) that the lower the gestational age, the higher the success rate is. The reason why these participants encounter failure in this treatment is unknown and unable to be explained, considering the small number of study participants.

Table 4. Side effects distribution (n=31)

Side Effects	Category	Frequency	Percentage (%)
Bleeding	Less than menstruation	22	71.0
	Equal to menstruation	9	29.0
	More than menstruation	0	0
Vomiting	No	31	100.0
	Yes	0	0
Diarrhea	No	29	93.5
	Yes	2	6.5
Shivering	No	21	67.7
	Yes	10	32.3

The side effects of the administration of oral 600 mcg single dose of misoprostol that were evaluated in this research consists of bleeding, vomiting, diarrhea, and shivering (Table 4). Montesinos and colleagues (2011) found that the side effect of bleeding equal to and less than menstruation is found in 22.6% and 50.0%, which is consistent with the findings in our research. Coyaji and colleagues (2007) found that there is no side effect of vomiting found in the administration of oral 600 mcg single dose misoprostol, just like this research. Montesinos and colleagues (2011) also found that the side effects of diarrhea were found in 4.7%, similar to the one found in this research (6.5%). The side effect of shivering was found in 32.3% of the participants, similar to the findings of the study done by Lumbiganon and colleagues (1999).

The difference of endometrial thickness before and 24 hours after the administration of misoprostol can be seen in Table 5. There is a significant difference between the endometrial thickness before and 24 hours after misoprostol administration, based on the statistical analysis. This finding is better explained by the guideline from

ACOG in 2018, where it was said that the expulsion of retained products of conception can be done by 24 hours (Lumbiganon et al., 1999). After adjustments of gestational age, there is a significant difference between the endometrial thickness before and 24 hours after misoprostol administration in the 8-12 weeks of gestational age group. But this study found no difference between the endometrial thickness before and 24 hours after misoprostol administration in the less than 8 weeks of gestational age group. This finding is inconsistent to the theory that the lesser the gestational age is, the better the efficacy of misoprostol in expelling the conception products, as it was said by Zikopoulos and colleagues (2002) and Lumbiganon et al. (1999). This inconsistency in unable to be explained considering the small number of study participants.

Table 5. Difference in endometrial thickness before and 24 hours after the administration of misoprostol

		Endometrial Thickness Before Misoprostol Administration (mm)	Endometrial Thickness After Misoprostol Administration (mm)	Difference (mm)	P Value
Misoprostol 600 mcg		19.50 ± 10.16	11.19 ± 6.35	8.31 ± 8.95	< 0.001
Gestational Age	< 8 weeks	18.51 ± 12.31	12.03 ± 8.77	6.48 ± 4.78	0.192
	8-12 weeks	19.98 ± 9.28	10.79 ± 5.03	6.48 ± 4.78	< 0.001

Conclusion

Misoprostol 600 mcg per oral dose is effective for the evacuation of retained conception tissue of incomplete abortion at less than 12 weeks gestation, so that it can be an alternative non-operative method of evacuating retained conception tissue in incomplete abortion cases other than the operative method. Side effects found were bleeding, diarrhea, and chills. Side effects of vomiting were not found in this study.

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