

PINEAPPLE JUICE CAN PREVENT SEROTINUS PREGNANCY TO MOTHERS WITH A HISTORY OF HORMONAL CONTRACEPTION IN SURAKARTA

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ABSTRAK

Latar Belakang Kehamilan *serotinus* meningkatkan risiko kesakitan dan kematian pada ibu dan bayi yang disebabkan oleh tidak adekuatnya kontraksi rahim akibat penggunaan kontrasepsi hormonal. Salah satu terapi komplementer yang terbukti dapat meningkatkan kontraksi uterus dengan cara mengkonsumsi buah nanas yang mengandung zat aktif bromelin.

Tujuan untuk membuktikan buah nanas dapat mencegah kehamilan *serotinus* pada ibu hamil dengan riwayat kontrasepsi hormonal.

Metode Penelitian ini adalah studi komparasi dengan menggunakan rancangan *quasy experimental design* dengan *design posttest with control*. Jumlah sampel 100 orang terdiri dari 50 orang perlakuan dan 50 orang kontrol.

Pada kelompok kontrol responden mengalami kehamilan *serotinus* 32 orang (64%). Rata-rata usia kehamilan terakhir pada kelompok kontrol 42 minggu (294 hari) sedang kelompok perlakuan rata rata kehamilan berakhir pada usia kehamilan 40 minggu (282 hari). Pada kelompok perlakuan tidak ada satupun responden (0%) yang mengalami kehamilan *serotinus*.

Hasil uji beda menunjukkan $p=0,00$ yang berarti ada perbedaan yang signifikan antara kelompok kontrol dan kelompok perlakuan sekaitan dengan kehamilan *serotinus*.

Kesimpulannya buah nanas dapat mencegah kehamilan *serotinus* pada ibu hamil dengan riwayat kontrasepsi hormonal.

Saran Jus nanas dapat dijadikan alternative pengobatan nonfarmokologis dalam mencegah kehamilan *serotinus*.

Kata kunci: Kehamilan *serotinus*, Kontrasepsi hormonal, Jus nanas

ABSTRACT

Background Serotinous pregnancy increases the risk of morbidity and mortality in the mother and baby caused by inadequate uterine contractions due to the use of hormonal contraception. One of the complementary therapies that is proven to increase uterine contractions by consuming of pineapple fruit which contains the active substance bromelain.

Purpose of this research to prove the pineapple fruit can prevent serotinous pregnancy with a history of hormonal contraception.

The method is study of comparisons by quasy experimental design with posttest with control. The number of samples are 100 people is composed of 50 people experiment group and 50 people control group. Pineapple fruit 150 gr in the form of juice given twice a day, twice a week to pregnant mother gestational age 37 weeks until delivery. The control group respondents shows pregnancy serotinous 32 people (64%). Group treatment none (0%) of respondents shows pregnancy serotinous.

Results show the difference $p = 0.00$ that means there is a significant difference between the control group and treatment group with serotinous pregnancy. The average gestational age in the control group the last 42 weeks (294 days) and The average gestational age in experiment pregnancy at gestational age 40 weeks (282 days).

Conclusion fruit pineapple can prevent pregnancy serotinous to pregnant women with a history of hormonal contraception.

Suggestion Pineapple juice can be used as an alternative non-pharmacological treatment in preventing serotinous pregnancy.

Keywords: Hormonal Contraceptive, pineapple fruit, pregnancy serotinous

INTRODUCTION

Serotinous pregnancy is a pregnancy that has lasted for 42 weeks (294 days) or more, on a regular menstrual cycle, an average of 28 days and the first day of the last menstrual period is known with certainty. Serotinous pregnancy is one of the high-risk pregnancies. It is closely associated with mortality, perinatal morbidity, or macrosomia. The risk for mothers with postterm pregnancies can be in the form of postpartum bleeding or increased obstetric actions (Prawiroharjo, 2008). Neonatal morbidity and mortality rates increase after 40 weeks of age. Fetal distress rates increase after 42 weeks of gestation or more, most occur intrapartum. However approximately 18% of pregnancies will continue beyond 41 weeks to 7% will be 42 weeks depending on the population and the criteria used to calculate gestational age (Cunningham, 2005; Varney 2006)

The cause of serotinous pregnancy is unknown, but there are risk factors in the form of parity, previous serotinous pregnancies, male fetuses, genetic factors and hormonal factors (Manuaba, 2007). Investigated the relationship between the duration of Depogrogestin injections and the incidence of overdue pregnancy at the Karanganyar Hospital with the result that there was a relationship between the duration of depoprogestin injections and overtime (Sutami, 2017)

Serotinous pregnancies and deliveries with their first child are at increased risk mainly because the mother has never experienced pregnancy and childbirth. Multipara risk of pregnancy and delivery of serotinus is increasing because women who give birth too often experience a decrease in the sensitivity of uterine contractions, causing uterine inertia which is one of the triggering factors for serotinous pregnancy (Kusmarjadi D., 2010). One of the causes of serotinous pregnancy is hormonal factors (Wiknjastro, 2010). Serotinous pregnancy is influenced by progesterone levels that do not fall quickly even though the pregnancy is quite a month, so that the sensitivity of the uterus to oxytocin is less (Taufan Nugroho, 2012).

Statistics show the mortality rate in serotinous pregnancy is higher than term pregnancy, where the mortality rate in serotinous pregnancy reaches 5-7%. Variations in the incidence of serotinus ranged from 231.37% (Hanafiah, 2006). In 2007 in Southeast Asian countries such as India, Bangladesh, Nepal and Myanmar, it was found that the incidence of serotinous pregnancies increased from 10% to 27%

if the first serotinous pregnancy would be 39% if they had consecutive serotinous pregnancies, meaning that if a woman in her first pregnancy had Serotinous pregnancy, then the possibility of the mother to get pregnant later in time is getting bigger and increasing (Komang, 2008). In Indonesia, recorded (3.5 -14%) births with serotinous pregnancies of the total first pregnancy. In this case, there is an increase in mortality in late pregnancy.

Serotinous pregnancy can be overcome through complementary therapy by consuming pineapple. Pineapple (*Ananas Comosus*) contains a lot of bromelain enzymes. Bromelain contained in pineapple stimulates an increase in prostaglandins, namely PGF2a from the endometrium and further stimulates meometrial contractions. Pineapple will stimulate prostaglandins, stimulate uterine contractions, help improve contractions and facilitate labor (Yanti, 2010). Pineapple also contains serotonin, a neurotransmitter in the central nervous system that can play a role in stimulating continuous contractions (Frochlich, 2000). Giving young and old pineapple extract significantly increased uterine contractions (young pineapple $p = 0.000$; old pineapple $p = 0.000$). The results of the Pearson correlation test proved that the larger the dose of pineapple extract, the stronger the uterine smooth muscle contractions (young pineapple = 0.944; old pineapple = 0.894) (Agustin, 2011). This research is one solution to treat serotinous pregnancy and reduce morbidity.

Data in Klaten district (2016) the target number of pregnant women is 16,116. In 2016 the incidence of serotinous pregnancy was 15 cases (4.87%) and in 2017 the incidence of serotinous pregnancy increased by 85 cases (17.13%). At the Karanganyar Regional Hospital in 2016 the number of deliveries was 1846 people, of which pathological was 1708 people and among them were postpartum deliveries as many as 376 people (20.91%), while in the last three months of 2017, the number of pathological deliveries with a history of hormonal contraception there are 209 people and 107 people who experience postdate. This study aims to determine the effect of pineapple juice on the prevention of serotinous pregnancy in mothers with a history of hormonal contraception in the Surakarta area.

METHODS

Type of research is quantitative with a quasi-experimental research design. The population of this

study were pregnant women with a gestational age of 37 weeks with a history of hormonal family planning. The inclusion criteria in this study were mothers who had used hormonal contraception for more than two years. Exclusion criteria were mothers who had a history of abortion/premature birth, experienced psychological disorders, head-pelvic disproportion, breech position, history of caesarean. In this research, the quota responden are 100 people consist of 50 respondents as the experimental group and 50 respondents as the control group. The instrument in this study used pineapple fruit in the form of juice and then drunk by pregnant women with a dose of 150 mg given twice a day, twice a week until delivery. Demographic data contain respondent characteristics such as name, age, gravida, history of serotinous pregnancy, current health status, address, telephone number. To find out serotinous pregnancy, use an observation sheet with structured interview techniques and see the card of health pregnant women. Pineapple juice used in this study is fresh pineapple (medium maturity). Juice preparations was chosen because easily digested and absorbed in the body. Pineapple juice made by researcher enumerators at Midwife Independent Practice with a dose of 150 mg given twice a day, twice a week until delivery. Determination of

gestational age based on gestational age calculated from first day of last menstruation. Serotinous pregnancy scores calculated 42 weeks and 37 to < 42 weeks is normal. The analysis used Chi square test with 95% confidence percentage.

RESULTS AND DISCUSSION

Frequency distribution of the influence of pineapple on the prevention of pregnancy serotinous

Table 1.
 Frequency distribution of the influence of pineapple on the prevention of pregnancy serotinous

Group	Normal	Serotinous
Control	18 (36 %)	32 (64%)
Experiment	50 (100 %)	0 (0 %)

From the table 1, it can be seen that Experiment group zero Serotinous pregnancy.

The effect of pineapple on the prevention of pregnancy serotinus (weeks)

Table 2.
 The effect of pineapple on the prevention of pregnancy serotinous

Group	Mean (SD)	Min	Max	p
Control	42 (6,6)	39	43	0,00
Experiment	40 (20,7)	38	41	

Table 2 shows there is a significant difference in the average length of the day of delivery between mothers who consume pineapples and those who do not consume pineapples

The results showed that fresh pineapple consumed in the form of juice had an effect on the prevention of serotinous pregnancy, namely pregnancy after 42 weeks (294 days). The results of the study in the control group, namely the group of pregnant women with a history of using hormonal contraception experienced serotinous pregnancy 32 people (64%). The results of the study in the treatment group showed that none of the pregnant women with a history of using hormonal contraception (0%) had a serotinous pregnancy.

The use of hormonal family planning continuously and for a long period of time, especially if the schedule for the injection of the hormone

progesterone is advanced, will cause the remaining hormones to accumulate in the body as a result of approaching the estimated day of delivery, uterine contractions are inadequate. This is what causes the control group to experience serotinous pregnancies and give birth 42 weeks.

In the treatment group, namely pregnant women with a history of using hormonal family planning, pineapple juice was given to improve uterine contractions so that they were expected to give birth on time or according to the estimated birth. Pineapple contains the enzyme bromelain (List and Horhammer, 1979). Pineapple contains the enzyme bromelain which can stimulate the production of prostaglandins. (Katno and Pramono, 2009). Increased levels of prostaglandins cause stimulation of uterine contractions. Bromelain stimulates an increase in prostaglandins, namely PGF2a from the

endometrium and further stimulates meometrial contractions (Alzubaidi 2004; Choco AS, 2011). Pineapple also contains serotonin, which is a neurotransmitter in the central nervous system that can play a role in stimulating uterine contractions (Frochich, 2000).

Pineapple (*Ananas comosus*) contains many nutrients, including vitamin A, calcium, phosphorus, magnesium, iron, sodium, potassium, dextrose, sucrose (cane sugar), and the enzyme bromelain (bromelain) which is a 95% mixture of cysteine proteases, which can hydrolyze proteins (proteolysis) and is resistant to heat. Ripe fruit contains 14% sugar, several digestive enzymes, bromelain, citric acid, malic acid, vitamin A, and vitamin B (Hosain, 2015). So far, young pineapples are considered to be able to prevent pregnancy, so they are often used to treat late menstruation and have the potential to be abortive. Young pineapple fruit extract contains a lot of bromelain enzymes. Bromelain is the main constituent of pineapple which is important and useful in the pharmaceutical and food fields. The function of bromelain is similar to papain and fisin, as a protein breaker. Bromelain enzymes are often used as contraceptives to prevent pregnancy. (Setyawati, 2011; Wuryanti, 2004; Katzung, 2010).

The bromelain enzyme has an abortifing effect, which inhibits implantation, increases uterine contractions, and is embryotoxic. The mechanism of action of bromelain is based on two types of prostaglandins, namely proinflammatory prostaglandins (PGE2 and PGF2) and anti-inflammatory prostaglandins (PGE1). Proinflammatory prostaglandins stimulate inflammation, platelet aggregation, and vasoconstriction, while anti-inflammatory prostaglandins work the opposite (Dukhani, 2012). Bromelain enzymes can stimulate an increase in prostaglandins and increase uterine contractions. Prostaglandins not only affect pregnant uterine contractions, but also have an effect on non-pregnant uterine contractions. During ovulation, progesterone levels increase and stimulate the release of prostaglandins, namely PGF2-alpha from the endometrium and further stimulate myometrial contractions. (Cunningham, 2012). Bromelain enzyme shows hydrolytic activity in connective tissue, especially against collagen compared to other myofibrillar proteins. Bromelain collagenase activity by hydrolyzing collagen is thought to be through the accumulation of hydroxyproline. Collagen which is hydrolyzed by the enzyme bromelain makes the body of the fetus very soft. (Setyawati, 2011) In humans, during early pregnancy, pineapple consumption should be limited or not consumed at all. (Irfan, 2016)

The mechanism of prostaglandins in uterine smooth muscle is the same as in other smooth muscle, namely by triggering the myometrial cells to contract by an increase in intracellular calcium Ca^{2+} . Prostaglandins increase Ca^{2+} by increasing the influx of Ca^{2+} across the cell membrane, by stimulating the release of calcium from intracellular stores and by enhancing the formation of myometrial gap junctions. The prostaglandin that acts on uterine smooth muscle contraction is $PGF2\alpha$. $PGF2\alpha$ is a strong stimulant of uterine smooth muscle contraction. The formation of prostaglandins by the amnion increases during pregnancy, especially towards the end of pregnancy. (Hefner JL, 2010; Jordan S, 2004)

The results of this study are in line with the results of Yanti's research (2010) which states that the conclusion of her research is that there is an effect of pineapple consumption starting at 36 weeks of gestation on uterine contractions of pregnant women. According to research conducted by Muzzaman (2009), young pineapples have a significant effect on the increase in uterine contractions with an effect of 85.9%. In Duhita et al's study also found an effect of 87.6% on young pineapple extract and 79.9% on old pineapple fruit extract. In addition, the content of pineapple which is also thought to increase contractions is serotonin. Serotonin is thought to increase uterine contractility by interacting with serotonin (5-HT) receptors in the uterus and providing direct stimulation of uterine smooth muscle. The mechanism of prostaglandins in uterine smooth muscle is the same as in other smooth muscle, namely by triggering the myometrial cells to contract by an increase in intracellular calcium Ca^{2+} . Prostaglandins increase Ca^{2+} by increasing the influx of Ca^{2+} across the cell membrane, by stimulating the release of calcium from intracellular stores and by enhancing the formation of myometrial gap junctions. The prostaglandin that acts on uterine smooth muscle contraction is $PGF2\alpha$. $PGF2\alpha$ is a strong stimulant of uterine smooth muscle contraction in pregnant or non-pregnant conditions. (Winarno FG, 1993; Jordan, 2004)

The formation of prostaglandins by the amnion increases during pregnancy, especially towards the end of pregnancy (Wentz AC, 1988). Pineapple is a fruit that has an influence on the birth process. Pineapple contains the enzyme bromelain which can stimulate the production of prostaglandins. Prostaglandins affect uterine contractions during pregnancy, but also affect uterine contractions in non-pregnant states. At the time of ovulation, progesterone levels increase and will stimulate the

release of prostaglandins, namely PGF₂α from the endometrium and will further stimulate contraction of the smooth muscle of the uterus. (Alzubaidi, 2004; Coco AS, 2011; Wentz AC, 1988)

Increased levels of prostaglandins cause contraction stimulation (Dewi, 2017). In addition, pineapple contains serotonin which also plays a role in stimulating uterine contractions (Frochlich & Meston, 2006). Bromelain has been known for its function since 1876. Bromelain was first used as a complementary therapeutic agent in 1957 by Heinicke and Gortner who found high concentrations of bromelain in pineapple stems (Silaban & Rahmanida, 2016). Bromelain is proven to have various health benefits, including having an effect on pregnant women and mothers giving birth. Bromelain works with a mechanism of action based on two types of prostaglandins, namely proinflammatory prostaglandins (PGE₂ and PGF₂) and anti-inflammatory prostaglandins (PGE₁). Pro-inflammatory prostaglandins stimulate inflammation (inflammation), platelet aggregation, and shrink blood vessels (vasoconstriction), while anti-inflammatory prostaglandins work in the opposite direction or vice versa (Wuryanti, 2004). The bromelain enzyme can stimulate an increase in prostaglandins and uterine contractions. Prostaglandins not only have an effect on uterine contractions during pregnancy and childbirth, but also have an effect on nonpregnant uterine contractions. During ovulation, progesterone levels increase and stimulate the release of prostaglandin PGF₂-alpha from the endometrium, thereby stimulating myometrial contractions. Thus, the bromelain enzyme has been shown to have a stimulating effect on uterine contractions (Cunningham, 2011)

Bromelain in increasing the activity of hydrolytic work on connective tissue, especially with collagen. Bromelain collagenase activity by hydrolyzing collagen is possible through accumulation of hydroxyproline (Ionescu et al., 2008). Pineapple extract that is consumed repeatedly has an effect or causes high levels of the bromelain enzyme in the blood. Bromelain causes hydrolysis of collagen, especially type III collagen. Collagen is a component of the walls of arteries, veins and capillaries of the body which can lead to vascular strength, structure and flexibility, so that systemic blood transportation can be effective (Sherwood, 2010).

CONCLUSION

There was a significant difference $p = 0.000$ between the control group and the Experiment group

which indicated the influence of pineapple juice on the prevention of serotinous pregnancy in pregnant women with a history of hormonal contraception. Respondents in the control group experienced serotinous pregnancy 32 people (64%). Respondents in the treatment group, none of the respondents (0%) had a serotinous pregnancy.

SUGGESTION

Pineapple juice can be used as an alternative non-pharmacological treatment in preventing serotinous pregnancy.

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