

Exclusive Breastfeeding Improvement Program Using Carica Papaya Leaf Extract on the Levels of Prolactin Hormones

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Abstract: *Introduction:* Exclusive breastfeeding coverage in Indonesia in 2016 has decreased to 54%. The main factor inhibiting breastfeeding is the absence of milk production 43.5% of mothers stopped breastfeeding because of less breast milk production. Efforts to defeat the problem of breast milk production are the use of herbal plants that have lactagogue. Papaya leaves contain active compounds that have a role in the breast milk production because it shows a lactagogue effect. The purpose of this study was to prove the effectiveness of giving papaya leaf extracts to prolactin hormone. *Methods:* Quasi-experiment with Pretest-Posttest design with nonequivalent control group. The samples were postpartum mothers with consecutive sampling totaling 48 respondents. The independent variables in this study were papaya leaf extract and prolactin hormone-dependent variable. Data analysis using paired t-test and one way ANOVA and Posthoc Test continued. *Results:* The results of the study based on bivariate analysis are the administration of papaya leaf extracts influences prolactin hormone changes ($p=0.010$). Posthoc test results Effective dose for increasing prolactin hormone levels is a dose of 800mg. *Conclusion:* The administration of papaya leaf extract is effective to increase prolactin hormone The effective dose is the papaya leaf extract 800mg.

Keywords: papaya leaf extract, prolactin hormon, breast milk production

1. Introduction

The relevance of this study relates breast milk production. Breast milk is the best food for babies. Exclusive breastfeeding can reduce the risks of death in infants. The main factor inhibiting breastfeeding is the lack of milk production. Mothers stop giving breast milk to babies Common reasons for mothers not giving a lack of milk production

2. Literature survey

Breast milk is the best food for babies because it contains nutrients needed by the baby.[1] Exclusive breastfeeding provides breast milk without giving other foods and drinks to babies from birth to 6 months, except for drugs and vitamins.[2] The main factor inhibiting breastfeeding is the lack of milk production.[3] Results of research by Chot in Australia stated that 29% of mothers stopped giving breast milk to babies.[4] Efforts to defeat the problem of breast milk production can be given pharmacological or non-pharmacological therapy. Examples of non-pharmacological therapy are hypnotherapy, massage techniques, acupuncture techniques[5] and infrared radiation and herbal medicine therapy. Herbal plants are used as natural lactagogue such as ginger, katuk (*Sauropus androgynous*) leaves, Moringa leaves, papaya leaves, bananas blossom, fenugreek, fennel seed, cumin seeds, *Plectranthus amboinicus* leaves.[6-8] Papaya leaves contain elements of minerals and micronutrients such as vitamin A, vitamin BI, vitamin C, calories, protein, fat, carbohydrates, calcium, phosphorus and iron and water. The content of calcium in papaya leaves is 353mg which is quite high when opposed to other types of

leaves.[9] Calcium is needed to increase production and expenditure of breast milk. Papaya leaves contain active compounds that play an active role in the production process of breast milk because it shows a lactagogue effect. Phytochemical analysis of papaya leaves (*Carica papaya L.*) that has been carried out shows that papaya leaves are positive for alkaloids, phenols, flavonoids, saponins and this also plays a role in increasing milk production. The purpose of this study was to prove the effectiveness of papaya leaves extracts on the increase in the hormone prolactin.[9],[10]

3. Methods/ Approach

This research uses Quasi-Experiment with Pretest-Posttest design with nonequivalent control Group. the number of samples in this study were 48 respondents who were divided into 3 groups, namely, the control group was given postpartum care standards (Nutrition Education, Exclusive breastfeeding, and breast care) and two treatment groups, namely with postpartum care standards plus papaya leaf extract capsules with a dose of 800 mg and 600 mg / day. The pretest was examined for prolactin hormone levels in each group, and followed by treatment in the experimental group. After the eight-day post test was carried out in each group. Informed research ethics in this study ,anonymity ,confidentially ,beneficent ,veracity, justice This research was submitted to the ethics committee of the Health Ministry of Health Polytechnic Semarang and was approved to be given Ethical Clearance number: 392 / KEPK / Poltekkes-Smg / EC / 2018

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4. Result and Discussion

4.1 Characteristics of Respondents

Table 1: Description the Characteristics of Age, Parity, Rest Pattern and Nutritional Pattern

Variable	Group			P-Value
	Dose of 800mg	Dose of 600mg	control	
Age Mean±SD	28,4 ± 4,91	27,5 ± 5,26	27,4 ± 4,24	0,552
Parity Primipara Multipara	37,5% 62,5%	56,2% 43,8%	31,2 % 68,8 %	0,405
Rest Pattern Mean±SD	7,06 ± 0,68	6,9 ± 0,77	6,8 ± 0,75	0,649
Nutritional Pattern <2900 Kkal >2900 Kkal	37,5% 62,5%	37,5% 62,5%	37,5% 62,5%	1,000

Table 1 is shown that in the age of respondents in this study were in the range of 20-35 years. The respondent's sleep rest pattern is an average of 6-7 hours per day. The majority of respondents are located in the multipara category, and maternal nutrition patterns are in accordance with the balanced nutrition guidelines for postpartum mothers, namely 2900 Kcal.

Age is one factor that influences breast milk production in mothers. Mothers who are less than 20-35 years old produce more breast milk than mothers who are more than 35 years old. And less than 20 years.[11] Multiparous mothers having greater milk production compared to primiparous mothers, this is due to the fact that prolactin receptors, the alveoli in the breast, have more in multipara so that the volume of milk produced will be more.[12]

The rest factor influences breast milk production. If the condition of the mother is too tired, lack of rest then breast milk will also decrease.[13] Less red blood cells to carry the ingredients to be treated by these acini cells so that the formation and removal of breast milk will be inhibited. The nutritional need of a non-breastfeeding mother is 2200 Kcal which if 700 Kcal is added, breastfeeding must be added per day.[14],[15] Maternal nutritional status during pregnancy and breastfeeding is a major factor in the production of breast milk. Mothers with good nutritional status have better than ASI production

4.2 Hormone levels of prolactin

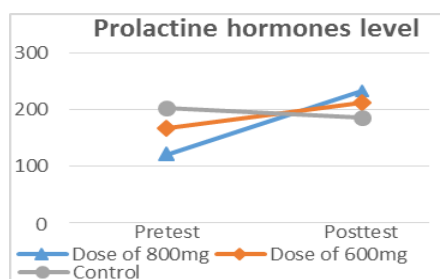


Figure 1: Effect of Carica Papaya Leaf Extract on Prolactin Hormones Level

Based on figure 1, it was found that the mean level of prolactin hormone in the intervention group I during childbirth care according to the standard with the addition of 800 mg papaya leaf capsules and 600 mg dose for 7 days increased, but the control group decreased. The highest increase was the dose group of 800mg

The results showed that the provision of postpartum care according to standards (breast care, nutritional education, and exclusive breastfeeding education) was accompanied by the addition of papaya leaf extract capsules taken for 7 days effective against increased levels of prolactin hormone. The dose of papaya leaf extracts 2 x 400mg experienced an increase in maternal prolactin hormone levels by 98%, the dose of papaya leaf extract 2 x 300mg increased by 27.2%, whereas in the control group decreased by 7.05%

One-way ANOVA test results found that there were significant differences between groups with p-Value= 0.010. Then a posthoc test was conducted to find out which groups were more effective against the increase in the hormone prolactin

Table 2: Posthoc Tamhane Test To Determine The Most Effective Dose

Group	P-value
Doses of 800mg – Dose of 600mg	0,145
Dose of 800mg - Control	0,034
Dose of 600mg – Control	0,362

Results of the Posthoc test showed that the intervention group I papaya leaf capsules 800mg better than the control. But there was no difference with the group given 600mg papaya leaves extract. And 600mg of papaya leaf extract group showed no difference from the control group. When viewed from the average increase in the hormone prolactin, the group was given additional papaya leaf capsules 800mg had the average difference in the highest prolactin hormone.

Breast milk production is prepared since the fetus in the womb, which is during pregnancy, the prolactin hormone from the placenta increases but breast milk usually does not come out because it is still inhibited by elevated estrogen levels.[16]

The 2nd or 3rd day after delivery, estrogen and progesterone levels drops dramatically, so the effect of prolactin is more dominant and ASI secretion begins. With early suckling, there is stimulation of the nipples, prolactin is formed by the pituitary so that milk production becomes smoother Placental release and lack of proper functioning of the corpus lutein then cause estrogen and progesterone, coupled with the presence of baby suction that stimulates the nipples and breasts, will stimulate sensory nerve endings that function as mechanical receptors. This stimulation continues to the hypothalamus through the spinal cord and mesencephalon. The hypothalamus will suppress the expenditure of factors that inhibit prolactin secretion and instead encourage the release of factors that promote

secretion. Factors that promote prolactin secretion will stimulate adenohypophysis (anterior pituitary) so that prolactin exits.[17],[18]

Factors that influence prolactin secretion are pharmacologically and non-pharmacologically. Non-pharmacological therapy, namely psychology, massage, hypnotherapy and the addition of mineral and flavonoid nutrients obtained from herbal plants, one of which is papaya leaves.[19],[20]

The results showed that the provision of postpartum care according to the standard with the addition of papaya leaf extract capsules at a dose of 800 mg has a higher effectiveness compared to the addition of papaya leaf extract capsules at a dose of 600 mg, this is due to the content of vitamins, minerals, proteins, and the active compound content. Flavonoids and polyphenols contained in 600mg papaya leaf capsules are relatively lower. A dosage of 800mg with a content of Flavonoid 17mg QE, phenol 38mg GAE, and calcium 56.48mg. While the dose of 600mg contain flavonoids 13mg QE, Phenol 28mg GAE and calcium 48.36mg. The effect of prolactin stimulation of phenolic leaves on papaya leaves can be attributed to their estrogenic activity which affects the dopaminergic control of prolactin.[21],[22] Flavonoids and polyphenols have a role in prolactin reflex to produce breast milk and can stimulate the hormone oxytocin to stimulate expenditure and drain ASI. Papaya leaves also contain alkaloids which act as α -adrenergic receptor agonists in the mammary gland duct which occurs synergistically with the hormone oxytocin in milk ejection lactotrophic cells for prolactin secretion. The higher the level of calcium, the higher the prolactin secretion. If calcium levels are less, prolactin secretion will also decrease. Calcium also plays a part in stimulating alveolar epithelial cells in the Mammae gland so as to increase milk production and secretion.[23]

Prolactin hormone levels in the control group decreased at post test, this was due to the stimulation is given to the control group that breast care was not very effective if it was not combined with a back massage and additional lactagogue which could increase maternal prolactin hormone levels. Breast massage given for 30 minutes to the breast affected the levels of the hormone oxytocin in nursing mothers but did not affect the levels of the hormone prolactin in the mother's blood.[24]

The decrease in prolactin hormone levels in the control group was due to the lack of stimulus given to the control group compared to the intervention group. The control group is given postpartum care standards, namely breast care which aims to improve blood circulation and prevent clogging of the milk production canal so as to facilitate the release of breast milk.

5. Conclusion

The administration of papaya leaf extract at a dose of 800mg has proven effective against an increase in prolactin hormone levels by 98%.

6. Future Scope

Researchers cannot control the intake of nutrients that contain lactagogue consumed by the mother which affects the mother's prolactin hormone.

7. Other Recommendation

For the next researcher, it should be given food restrictions that may and may not be consumed by the mother during the research process.

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