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The Effectiveness of Virgin Coconut Oil (VCO) and Sunflower Oil on Striae Gravidarum of Second Trimester Pregnancy in Public Health Centre of Tumpaan Manado, North Sulawesi

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ABSTRACT

Striae Gravidarum can be prevented by giving virgin coconut oil which is pure oil by farmers specifically for the province of North Sulawesi, which is the main product of coconut raw materials containing lauric acid and oleic acid which are effective in maintaining skin elasticity. Sunflower Oil developed without going through genetic engineering from plants contain more linoleic acid than oleic acid. The purpose of the study was to determine the effect of giving oil on the incidence of striae gravidarum in pregnant women. Method: analytical research design quasi-experimental approach pre-posttest design with two groups. Samples were all primigravida pregnant women with gestational age of 20-28 weeks as many as 50 samples consisting of 25 respondents were given VCO and 25 respondents were given Sunflower Oil. Bivariate data analysis with t-independent pairet test. The results of this study applying VCO with an average amount of 136.1 ml, there was a difference in the pairet test test(p=0.000) giving sunflower oil before and after applying sunflower oil on average as much as 128 ml there was a difference before and after being given sunflower oil(p= 0.008) The conclusion is there is a difference before and after applying VCO and Sunflower Oil.

Keywords: virgin coconut oil (VCO); striae gravidarum; pregnant women

INTRODUCTION

Pregnancy affects the mother's body as a whole with physiological changes that essentially occur in all organ systems. Most changes in the mother's body are temporary and caused by hormonal action. It affects the uterus, vagina, breasts, urinary tract, alimentary tract, respiratory tract, skeleton and joints, metabolism, cardiovascular, and skin. Changes in the skin, namely the appearance of a very stretched skin surface and an increase in hormone secretion in the adrenal cortex due to pregnancy which causes collagen fibers to rupture, this rupture is then called Striae Gravidarum (SG)[(1)].Virgin Coconut Oil (VCO) is a natural processed product that is starting to be widely used to improve health. and. The province of North Sulawesi is the largest producer of coconut which has recently decreased the price of copra so that many people turn to the profession to make processing it themselves. VCO contains 92% saturated fatty acids consisting of 48-53% lauric acid (C12), 1.5-2.5% oleic acid and other fatty acids such as 8% caprylic acid (C:8) and 7% capric acid (C:8). C:10). The content of fatty acids (especially lauric and oleic acids) in VCO softens the skin. In addition, VCO which is processed without using heating, contains vitamins A, C and E which are effectively used as moisturizers on the skin, so that it can increase skin hydration and accelerate wound healing. This content is then suspected to be positively correlated with skin elasticity[(2)].

Sunflower seed oil is a non-volatile oil produced from compressed sunflower (Helianthus annuus) seeds. Sunflower seed oil is usually used in cooking as cooking oil and cosmetic raw materials. Sunflower oil has a mixture of monounsaturated fats, polyunsaturated main constituents oleic acid and linoleic acid. Sunflower oil (sunflower oil) Acid Linoleic (omega-6) and linolenic acid (omega-3) contained in sunflower seed oil are polyunsaturated fatty

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acids and act as essential fatty acids for the body. Linoleic acid has the same function as linolenic acid, which can prevent skin dryness and inflammation. The main ingredients of sunflower seed oil are: Palmitic acid (saturated): 4–9% Stearic acid (saturated): 1–7%, Oleic acid (monounsaturated omega-9): 14–40%, Linoleic acid (unsaturated) double omega-6): 48–74% [(3)]. The results of the measurement of antioxidant activity of sunflower seed oil obtained an IC50 value of 88.372 g/mL, so it can be grouped into antioxidants that have strong activity. The presence of antioxidant activity from sunflower seed oil which has a fairly high vitamin E content of 58.7 and -carotene of 1.87, where both compounds are useful as antioxidants [(3)].

Striae gravidarum is a form of scarring of the skin due to stretching during pregnancy and weight gain during pregnancy gravidarum is a sign of scarring in the form of white streaks that extend with an irregular pattern. Striae gravidarum is formed due to stretching of the skin while the elastic tissue at the bottom of the skin is torn due to the stretching. For pregnant women, of course, they are very susceptible to striae gravidarum, because the skin experiences a lot of stretching due to the enlargement of pregnancy from month to month. The streaks that appear are shaped like grooved lines on the surface of the skin with a slightly white color. Sometimes there is also itching in the scratch and around it. Not a few mothers who complain of striae gravidarum during pregnancy and after giving birth. cannot be eliminated 100 percent, its presence can be minimized with early skin care[(4)].

Astri Yulia Sari Lubis et al's study found a significant difference between the Olive Oil group with VCO (p = 0.031) and the VCO group with Placebo (p = 0.005), but there was no significant difference between the Olive Oil and Placebo group (p = 0.53)[(5)]. Research by Rodhiyah et al. examined the effect of sunflower seed oil on wound healing, which can accelerate the inflammatory phase so that wound healing becomes faster. The results of interviews with several primiparous pregnant women, according to the experience of friends who have been pregnant, which occurs on the skin such as the stomach, breasts and thighs, often have brown streaks that do not go away, causing stress for pregnancy. One of the changes that occur in the mother during pregnancy is changes in the skin so that the mother feels anxious and depressed in dealing with these changes[(6)]. In the USA in 2004, out of 8000 pregnant women there were 21.9% who suffered from anxiety. In Indonesia, there are data on pregnant women who experience anxiety as many as 107,000 people (28.7%). Anxiety can be very dangerous for pregnant women, because it can affect the health of the fetus or mother[(7)].

Based on the health profile of North Sulawesi Province in 2016, the number of pregnant women was 49,753 people or 2.04 percent[(8)]. Pregnant women in South Minahasa Regency was 3721 pregnant women who experienced strie gravidarum as many as 1865 people or 50.01% [(9)]. To reduce anxiety during pregnancy due to changes that occur during pregnancy such as the skin called striae gravidarum is to reduce the severity of the occurrence of striae gravidarum by using virgin coconut oil (Virgin Coconut Oil) in 100 g containing 0.1 mg of Vitamin E which is a A powerful fat soluble antioxidant needed to protect cell membranes, mucous membranes and skin from harmful free radicals[(10)].

Based on the pre-survey conducted at the Tumpaan Health Center, Tumpaan Dua sub-district is one of the health centers in the South Minahasa district. Based on an initial survey conducted in November 2018, data on the number of pregnant women who had their pregnancy checked from January to November 2018 were 316 pregnant women.

METHODS

This type of research was an analytical survey with a quasi-experimental approach with a pretest-posttest design with two groups. The research location was at the Tumpaan Health Center, Tumpaan Dua District, South Minahasa Regency with the time of the study starting from August to November 2019. The population in the study were all pregnant women who had their pregnancy checked from June to December 2018 with a total of 361 pregnant women. Sampling was done by non-probability sampling using accidental sampling. Respondents who became the sample were mothers with primigravida gestational age 20-24 weeks who checked their pregnancy at the Tumpaan Health Center until the end of the study, there were 50 pregnant women consisting of 25 pregnant women getting VCO smears and 25 pregnant women getting Sunflower Oil smears. This study used pre-post observation sheets in the form of checklists and qualitative data analysis was presented in narrative form, while quantitative data was done through a computer using a program. The univariate analysis was carried out to explain the characteristics of the study, namely striae gravidarum before and after the intervention in the form of giving VCO and sunflower in the form of frequency and percentage distributions. Bivariate analysis was carried out using statistical tests to test the difference in the mean dependent, namely the independent t-test. With a significance level of 95%.

RESULTS

Respondents Characteristics

Table 1 shows that most of the respondents were less than 20-35 years old (80%) where the average age of the respondents was 26 years, the youngest was 19 years old and the oldest was 31 years old. At the age of 20-35 years is a

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fairly mature age in the development of one's soul. Most respondents' education was high school level 56% and most jobs was private 56%.

Table 1. Distribution of respondents characteristics on VCO provision based on age, education and occupation at the Tumpaan Health Center, South Minahasa Regency in 2019

No	Characteristics	Frequency	Percentage
1	Age:		
	< 20	4	16
	20-35	20	80
	> 35	1	4
2.	Education :		
	Junior high school	8	32
	Senior high school	14	56
	College	3	12
3.	Occupation:		
	Housewife	6	24
	Private	10	40
	Government employees	9	36

Table 2. Distribution of respondents' characteristics on the provision of sunflower oil based on age, education and occupation at the Tumpaan Health Center, South Minahasa Regency in 2019

No	Characteristic	Frequency	Percentage
1	Age:		
	< 20	2	8
	20-30	22	88
	> 31	1	4
2.	Edication:		
	Junior High School	6	24
	Senior High School	17	68
	College	2	8
3.	Occupation:		
	Housewife	8	32
	Private	10	40
	Government Employees	7	28

The age of pregnant women in the sunflower oil group was the youngest 20 years and the oldest 31 years, with an average age of 24 years. The majority of respondents' education was SMA/SMK was 68% and most occupations were household workers 32%.

Table 3. Respondents' gestational age on applying VCO at the Tumpaan Health Center, South Minahasa Regency

Gestasional age	Treatment group			
	VCO		Sunflower oil	
	Frequency	Percentage	Frequency	Percentage
20-23 weeks	13	52	11	44
24-26 weeks	9	36	13	52

The youngest VCO group was 20 weeks of gestation and the oldest was 26 weeks, with a mean of 23 weeks 2.1 days and spread between 22.23 ± 1.33 (21 weeks-23 weeks). The gestational age of the most respondents from the group group was 23 weeks. The youngest respondent's gestational age in the Sunflower oil group was 20 weeks 2 days and the oldest was 24 weeks, with a mean of 23 weeks, 6.8 days and spread between 22.22 ± 1.36 (22 weeks – 24 weeks).

Table 4. Striae gravidarum before and after giving VCO and sunflower oil to pregnant women

Line SG	VCO				Sunflower Oil				Total
	< 3 SG		>3 SG		< 3 SG		>3 SG		
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Before	9	36	16	64	8	36	17	68	50
After	21	84	4	16	16	64	9	36	50
Total	25		20		26		24		

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Striae gravidarum before smearing with VCO, the SG line which is mostly above 3 lines is 64% and after smearing the SG line < 3 lines it increases to 84% from the previous 36%. The Strea Graviadarum line before applying Sunflower Oil is mostly >3 SG, which is 68% and after applying it, <3 SG line is 64%.

Table 5. Erythema gravidarum lines before and after giving VCO and sunflower to pregnant women

Line SG	VCO				Sunflower Oil				Total
	1= Mild		2= Severe		1= Mild		2 = Severe		
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	
Before	9	36	16	64	8	32	17	68	50
After	20	80	5	20	16	64	9	36	50
Total	25		20		26		24		

The erythema gravidarum line before applying VCO was moderate, the red to purple colored erythema line was said to be severe with the same category as 2 as much as 64% while before applying the color of the erythema line that appeared with a pink classification and a light category or 1 as much as 80%. Sunflower Oil before applying there is an erythema line that is dark red to purple which is said to be moderate to severe with the same category as 2 as much as 68% while before applying there is an erythema line that appears with a pink classification with a light category or 1 as much as 64%.

Table 6. Comparison of striae gravidarum lines VCO group to pregnant women at the Tumpaan Health Center

Line SG	VCO				Total	p
	< 3 SG		>3 SG			
	Frequency	Percentage	Frequency	Percentage		
Before	9	36	16	64	50	0,000
After	21	84	4	16	50	
Total	25		20			

Mean = 0.4800; df = 24; p = 0.000

The application of virgin coconut oil (VCO) was able to prevent the appearance of SG, by looking at the specifications of the lines that appeared before applying the most > 3 SG lines as much as 64% compared to those after applying VCO which decreased to 16% after the Paired Samples test was carried out. The test has a significant significance with p value = 0.008.

Tabel 7. Comparison of the appearance of striae gravidarum lines in the sunflower oil group and the sunflower oil group in pregnant women at the Tumpaan Health Center

Line SG	Sunflower Oil				Total	p
	< 3 SG		>3 SG			
	Frequency	Percentage	Frequency	Percentage		
Before	8	36	17	68	50	0,008
After	16	64	9	36	50	
Total	26		24			

Mean = 0.4800; df = 24; p = 0.008

Table 7 the application of sunflower oil was able to prevent the appearance of SG, by looking at the specifications of the lines that appeared before applying the most >3 SG lines as much as 68% compared to those after applying VCO which decreased to 36% after the Paired Samples Test was carried out, there was a significant difference, with p-value = 0.008.

Table 8. Comparison of erythema gravidarum lines in the vco group to pregnant women at the Tumpaan Health Center

Line SG	VCO				Total	p
	1 = Mild		2 = Severe			
	Frequency	Percentage	Frequency	Percentage		
Before	9	36	16	64	50	0,005
Aftter	20	80	5	20	50	
Total	25		20			

Mean = 0.4400; SD=0.71; df = 24; p = 0.008

Table 8 shows the number of colored lines that break or the amount of collagen that breaks due to pregnancy, while the level of erythema which provides information on the release of SG, and the results obtained for before applying the level of erythema with a heavy level or dark red color to excellence given = 2 as much as 64% and after applying VCO with an erythema level with a heavy level or dark red color until the excellence given = 2 becomes 20% less after being analyzed using the Paired Samples Test, there is a p-value = 0.005

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Table 9. Comparison of the appearance of erythema gravidarum lines in the sunflower oil group in pregnant women at the Tumpaan Health Center

Line SG	Sunflower oil				Total	P
	1= Mild		2 = Severe			
	Frequency	Percentage	Frequency	Percentage		
Before	8	32	17	68	50	0,008
After	16	64	9	36	50	
Total	26		24			

mean = 0.3300; SD = 0.56; df = 23; p = 0.008

Table 9 shows the number of lines that are broken in color or the amount of collagen that is broken due to pregnancy, while the level of erythema which gives information about the discharge of SG, and the results obtained for before applying the level of erythema with a level of severity or dark red color to the severity given = 2 as much as 68% and after applying sunflower oil, the erythema level was said to be heavy or dark red until the strength given = 2 became 20% less after being analyzed using the Paired Samples Test, there was a significant p value = 0.005.

DISCUSSION

Characteristics of respondents based on the age of respondents who were given VCO most of the respondents were aged less than 20 - 35 years with an average age of 26 years, the youngest was 19 years and the oldest was 31 years. At the age of 20-35 years is an age that is quite mature in the development of one's soul and can be arranged to work together. In this study, maternal age was not an obstacle so that during the study there were no obstacles from either the researcher or the respondent. The majority of respondents' education is at the high school level, which is a senior secondary education that is able to collaborate in research and the majority of jobs are private. Age characteristics of respondents in the Sunflower Oil group, the youngest was 20 years and the oldest was 31 years, with a mean age of 23 years and spread between 25.50 ± 3.27 (24 years - 31 years). The majority of respondents education is senior high school and most occupations are household workers.

The normality test in the VCO group was the youngest 19 years old and the oldest 31 years old, with a mean age of 23 years and spread between 22 years - 26 years. A significance value of 0.056 (p>0.05) means that there is no difference. The youngest respondent's gestational age in the Sunflower oil group was 20 weeks 12 days and the oldest 26 weeks, with a mean of 23 weeks 6.8 days and spread between 21.32 ± 1.26 (21 weeks – 23 weeks). and a significance value of 0.562 (p > 0.05) meaning that there was no difference in the mean gestational age in the two groups. Strea Gravidarum Before and After Giving VCO and Sunflower Line Strea gravidarum before smearing with VCO the SG line was mostly above 3 lines and after applying the SG line < 3 lines it increased to 84% from the previous 36%. The Strea Graviadarum line before applying Sunflower Oil was mostly >3 SG, which was 68% and after applying <3 lines, the SG was 64%. The volume of basting for the VCO group was at least 103 ml, a maximum of 154 ml and the average was 136.1 ml. , while the smearing volume for the Sun flower group was at least 114 ml, a maximum of 142 ml and an average of 128 ml. The volume of smearing carried out by the most respondents was the VCO group with a significance value of 0.000 (p <0.05) meaning that there was a difference in the mean basting volume between the VCO and Sunflower groups.

Comparison of the appearance of Striae Gravidarum Lines in the VCO group before and after smearing, seen the number of lines and the color level of the erythema line is the number of lines that break due to increasing pregnancy, while the level of erythema provides predictive information for SG discharge, the results obtained have a significant difference for the appearance of Striae Gravidarum p<0.05, although it is not known for certain at what gestational age Striae Gravidarum began to occur. The effectiveness of applying Virgin Coconut Oil (VCO) topically will prevent significant degrees of Striae Gravidarum in the second trimester of pregnancy. After the Pairet T test was carried out on administration before and after applying VCO (p = 0.000), which means that there was a difference before and after being given VCO smearing on pregnant women in the second trimester. VCO is only hydrophobic so that the entry point for oil only passes through the epidermis and hair, but the potential for evaporation is very small. Collagen synthesis and strength are affected by vitamin C, collagen fragility indicates the degree of erythema in striae gravidarum. Changes in the degree of erythema in SG are the result of atrophy and flattening of the epidermal structure, while vitamin A functions to maintain the structure of the epidermis. Virgin coconut oil is an oil that is rich in vitamin C, but is not found in sunflower oil, effects of Olive Oil and Virgin Coconut Oil on Striae Gravidarum that Virgin coconut oil (VCO) is more able to prevent the appearance of SG than olive oil, regardless of the specification of the lines that appear (average in both groups and levels). erythema). the content in both oils, VCO contains more substances that are able to maintain skin elasticity [(2)].

Striae gravidarum, also known as stretch marks, are scars that appear on the surface of the skin due to excessive stretching of the skin tissue. Striae gravidarum can appear on the abdomen, breasts, thighs or upper arms, and is evident

from the 6-7th month of pregnancy. These fine or rough strokes can appear in some pregnant women, due to the level of skin elasticity and weight gain (fat deposits). Comparison emerged of Strea Gravidarum in the Sunflower Oil group. Comparison of Striae Gravidarum lines before and after applying sunflower Oil when viewed from the number of lines and the color level of the erythematous lines is the number of lines that break due to increasing pregnancy and the level of erythema provides information on predicting SG discharge, the results obtained have a significant difference for the appearance of Striae Gravidarum p< 0.05, before and after being given sunflower oil, although it is not known for certain at what gestational age Striae Gravidarum began to occur, the effectiveness of giving sunflower oil in topical application will prevent the occurrence of degrees significantly. After the Pairet T test was carried out on the administration of before and after the application of sunflower (p = 0.008), which means that there was a difference before and after being given the application of sunflower in the second trimester of pregnancy.

Comparison of the appearance of Erythema Striae Gravidarum in the VCO group. Comparison before applying the level of erythema and after applying VCO, the level of severe erythema or dark red color was carried out until the superiority became less, after being analyzed using the Paired Samples Test there was a significant p value = 0.005 which means there is a difference. The content in VCO is lauric acid, oleic acid, -tocopherol, vitamin A, omega 3, and moisturizer. The content in VCO that is not found in Sunfloeroil is vitamin C and low water content. Comparison of the appearance of Erythema Striae Gravidarum in the Sunflower oil group, the level of erythema which provides information on the release of SG, and the results obtained for before applying the level of erythema with a heavy level or dark red color until the superiority becomes less, after being analyzed using the Paired Samples Test there is a significant value p value = 0.005. This study has similarities with the research of Venny and Nia where VCO administration is effective in reducing strea gravidarum in pregnant women where the p value = 0.000 (p <0.05) [(10)].

Sunflower seed oil is one type of plant oil that is beneficial for skin health. This oil contains linoleic acid and linolenic acid which can form a thin layer of artificial fat on the surface of the skin. This layer of fat serves to reduce the evaporation of water from the skin [(11)]. Fatty acid levels contained in sunflower seed oil based on the analysis and European Pharmacopoeia (2005) Palmitic acid 4.0 - 9.0 Stearic acid 1.0 - 7.0 Oleic acid 14.0 - 40.0 Linoleic acid 48, 0 -74.0.

CONCLUSION

The appearance of striae gravidarum in pregnant women can cause anxiety and depression. Anxiety can be very dangerous for pregnant women, because it can affect the health of the fetus or mother. To overcome this, pure coconut oil (Virgin Coconut Oil / VCO) and Sunflower Oil are used. This study was conducted on primigravida pregnant women with gestational age between 20-28 weeks as many as 50 samples consisting of 25 respondents were given VCO and 25 respondents were given Sunflower Oil. There is a difference before and after applying VCO and Sunflower Oil based on the level of erythema and the number of striae gravidarum lines in pregnant women.

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