

Fat Intake Comparison Based on Acne Vulgaris Gradation in Beauty Vocational High School Girls in Padang City

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Abstract

Acne vulgaris is an inflammatory disease of skin polysebaceous follicles that frequently occurred in adolescents and young adults. Food is one of considered risk factors that had role in acne. High fat diet, including saturated fatty acids, can be a trigger or increase severity of acne. This study aimed to observe fat intake comparison in different acne gradations. This was an analytic observational study with cross sectional design which required 76 aged 14-18 years old girl students of Beauty Vocational High School in Padang whom fulfill inclusion and exclusion criteria. Fat intake data was obtained using the Semi Quantitative Food Frequency Questionnaire (SQFFQ) and acne gradations were graded using Lehmann's criteria. The average of student's total fat intake was 93.03 ± 53.47 grams/day and saturated fat intake was 30.44 ± 18.77 grams/day. Data analysis by one way ANOVA showed significant difference in total fat intake based on acne gradations ($p < 0.05$), and the otherwise, there was no difference in saturated fat intake ($p > 0.05$). Total and saturated fat intake in female students were above of NCEP limit recommendation. There was difference in fat intake based on acne gradation in girl students of Beauty Vocational High School in Padang.

Keywords: *Acne vulgaris, fat intake, acne gradation, girl students*

INTRODUCTION

Acne Vulgaris is a chronic inflammatory disease of skin pilosebaceous follicle (Wasitaatmadja, 2011). Acne often became a problem and reduce the confidence of the sufferer. Acne vulgaris is common in 13-19 years old adolescents and nearly 85% of 12 to 25 years old had experienced acne in varying degrees. (M. Wasitaatmadja, 2018) Acne is the most common skin disease in Indonesia. Data from Skin and Veneral Health Department of dr. Sutomo Hospital of Surabaya since 2006-2008 found that Acne vulgaris was the 10 most prevalent diseases, while in Skin and Veneral Health Department of dr. Cipto Mangunkusumo Dr. Cipto Mangunkusumo (RSCM) in Jakarta from 2008-2010 found 6612 cases of acne (IKKK, 2012).

The definitive etiology of acne are still unknown, there are several risk factors can lead to acne, they are genetic, hormonal, food, cosmetics, psychical stress, and other. The underlying mechanism of acne formation is increased sebum production by sebaceous glands, keratinocytes hyperproliferation cause sebaceous glands obstruction

and improve *Propionibacterium acnes* population, bacteria that cause inflammation process. (Juhl et al, 2018). Clinical symptoms of acne can grouped become two, uninflammation acne those are open and close blackheads, and inflammation acne ie, papules, pustules and nodules (M. Wasitaatmadja, 2011).

There was a relationship between acne and personal diet, but it is still a controversy. (Sihaloho and Indramaya, 2016). Several studies about relationship between food with acne showed mixed results. (Estri and Susanto, 2013). Some studies showed that diet has relationship with acne. High fat intake, especially saturated fat could trigger and aggravate acne. (Tailor M, 2011). Research conducted by Ikaraoha et al 2005 on 174 Nigerian students showed the influence of fat dietary on acne. The Wei et al 2010 study in China on 5696 subjects also found that a high-fat diet (including fried foods) could increase the incidence of acne (Ikaraoha et al, 2005). Women who consumed a lot of foods that contain saturated fat, trans fat, and dairy products were more likely to have acne (Ananda, 2014). This research needs to be further tested especially for other area populations who may have different eating patterns.

Fat intake can cause an increasing and changing in sebum production by sebaceous glands (M.Wasitaatmadja, 2011). High-fat milk contains Insulin-Likegrowth factor (IGF-1) which can affect or aggravate acne. IGF-1 can increase circulating androgen levels which affect the sebaceous glands. IGF-1 also plays a role in stimulating the sebaceous glands in producing sebum (Kusumaningrum D., 2019). Current research on relationship between diet and acne vulgaris continues to be done because of hypothesis which state food can affect endocrine factors, that involved in the onset of acne vulgaris (Panjaitan et al, 2011).

SMKN 6 and SMKN 7 are Beauty Vocational High Schools in Padang. Early direct observations on Vocational School girl students found about 25% of them had acne vulgaris. Acne students often felt less confident with their face condition. Most beauty vocational high school girl students often consumed meal that sold at school canteens such as snacks, fried foods. Various fast food, and other. These kind of foods could stimulate androgen hormones and increase sebum production in sebaceous glands and trigger or aggravate acne (Hasan, 2015). Based on this background, we are interested to set further research about relationship between fat intake with degree of severity (gradation) of acne vulgaris. The aims of this study are comparing fat intake based on acne vulgaris gradation.

METHOD

This was an observational analytic study with cross sectional design. Population of this study were all girl students of SMKN 6 and SMKN 7, Beauty Vocational High School in Padang. Sample of this study were girl students with age 14-18 years old and suffering acne vulgaris. Inclusion criteria of sample were willing to become respondents, signed informed consent, and not in acne treatment period in last 1 month before joining study. Sample techniques did by consecutive sampling technique that required 76 girl students. This study conducted at SMK 6 and SMK 7 in Padang from September to December 2018. The fat intake data were obtained using Semi-Quantitative Food frequency Questionnaire (SQFFQ) and acne gradation assessed by Lehmann criteria. Data were collected by interview and physical examination. Data were analyzed by univariate and bivariate using oneway Anova test.

RESULTS AND DISCUSSION

This study was conducted to 76 students of SMKN 6 and SMKN 7 Padang, the result are:

Table 1 Distribution of Acne Vulgaris gradation according to the Lehman criteria

Gradation of acne vulgaris	F	%
Mild	35	46
Moderate	33	43
Severe	8	11
	76	100

Table 1 shows that most girl students had acne vulgaris mild gradation with 35 students (46%).

Table 2 Mean of Total Fat Intake based on gradation of acne vulgaris

Level of Acne gradation	n	Mean (grams/day)	SD	p
Mild	35	82,41	46.70	0.03
Moderate	33	93.73	42.07	
Severe	8	136.56	96.04	
Total	76	93.03	53.47	

In Table 2, the mean total fat intake of 76 students was 93.03 ± 53.47 gram / day. After oneway Anova test, obtained p value = 0.03 ($p < 0.05$), it could be concluded that there was a significant difference in mean total fat intake based on a acne vulgaris gradation.

Table 3 Mean of Saturated Fat Intake by gradation Acne vulgaris

Level	n	Average (Grams /day)	SD	P
Mild	35	27.58	19.69	0.373
Moderate	33	31.87	16.72	
Severe	8	37.06	22.73	
Total	76	30.44	18.77	

Table3 showed the mean of saturated fat intake (SAFA) of Beauty Vacation High School Girl Students was 30.44 ± 18.77 gram/day. *OnewayAnova* test got p value was 0.37 ($p > 0,05$), we could conclude that there was no significant difference of mean saturated fat intake according acne vulgaris gradations.

This study found that the most number of acne gradation was mild gradation (46%), followed by moderate (43%) and the last one was severe (11%). The same results were also shown in research by Sulistia Tan et al 2015 in Jambi, they found that the highest incidence of acne was mild gradation acne (49%), followed by moderate gradation of acne vulgaris (42%) and severe gradation of acne vulgaris (9%) (Sulistia Tan et al 2015). Acne gradation was influenced by several factors such as genetic, environment etc.

The average total fat intake in this study was 93.03 ± 53.47 grams / day (42.27% of total calories). Anova oneway test results found a significant difference in the average total fat consumption based on gradation of acne vulgaris ($p < 0.05$). Based on the results above, it could be concluded the total fat intake of Beauty Vacation High School girl students is 42.27%, it was not suitable and exceeds the <30% recommended National Cholesterol Education Program (NCEP) and 20-30% American Heart Association (AHA). High fat intake could increase sebum production and change sebum composition in the sebaceous glands (Kusumastuti and Indrawan, 2013). The results of this study were in accordance with study by Wei et al (2010) in China, their 5696 subjects with high-fat diet had an increase of acne incidence. High fat intake could increase the concentration of IGF-1 which lead to increasing in sebum production and stimulating the hormone androgen (Sutiono et al, 2017). IGF-1 also causes sebaceous gland hyperkeratinization that lead to formation of microcomedos (Sihaloho and Indramaya, 2016).

Saturated fat intake in this study sample was 30.44 ± 18.77 gr/day (13.89% of total calories). Saturated fat intake in Beauty Vocational High School girl students in Padang also exceeded NCEP and AHA recommendations, which was <10%. Study by Indrawan and Kusumastuti (2013) showed no relationship between saturated fat intake and incidence of acne vulgaris. Indrawan and Kusumastuti, (2013) stated that this was allegedly due to respondents with more than enough fat intake stated that they doing regular facial cleansing. Maintaining regular and proper facial hygiene could reduce dirt and sebum on skin surface (Lamp, 2010). Study by Syabatini (2018) on Beauty Vocational High School students in Padang city, found the average level of facial skin hygiene was in the good category, and this was thought to cause no difference in saturated fat intake based on acne gradations. The study limitation was not able to involve several other risk factors which were also cause acne vulgaris, they were Genetic, Psychological Stress etc.

CONCLUSION

Most Beauty Vocational High School girl students in Padang had mild gradations acne vulgaris. There was significant difference in total fat intake based on gradation of acne vulgaris ($p < 0.05$), but there was no significant difference between saturated fat intake based on gradation of acne vulgaris.

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