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The Effects of Junk Food Consumption on Incidence of Early Puberty in Adolescent Females

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ABSTRACT

The transition between childhood and adulthood is the period of puberty be marked is rapid body growth, the appearance of secondary sex features, menarche, and psychic changes. Menarche is too early to be associated with risk factors for some malignant disease such as ovarian cancer, breast cancer, and myoma. Hyperplasia cholecystitis, incidence of uterine cancer and risk of Non Insulin Dependent Diabetes Mellitus (NIDDM / Type II) as adults. The consumption of junk food tends to increase from year to year. Consumption of junk food tends to increase which affects nutritional improvement. This is because the fat content, animal protein and trans fat contained in junk food will trigger the release of hormones that affect the occurrence of menarche and the emergence of secondary signs in children faster than normal age. The purpose of this study analyzed the effect of junk food consumption on early puberty incidence on female teenagers of junior high school in Jember regency. This study was conducted in two stages, the first quantitative observational analytic study with cross sectional design and the second stage of the laboratory using pre experimental design with one shot case study approach for the most frequently consumed food samples. The sample of this research is 88 female teenagers of junior high school. Data analysis was processed using logistic regression test of significance level $p<0.05$. Result showed that there was significant effect between junk food consumption pattern on early puberty statistically $p = 0.002$. The laboratory test results also showed that the fat content of junk food on average over 20%. Consumption habits, consumption time and percentage of fat consumed from junk food affect the incidence of early puberty in female teenagers, while the frequency of consumption does not affect the incidence of early puberty.

Keywords: Early puberty, Junk food, Fat

INTRODUCTION

The transition between childhood and adulthood is the period of puberty. There is no sharp boundary between late childhood and early puberty, but puberty begins with the functioning of the ovaries. Important events in puberty are rapid body growth, the appearance of secondary sex features, menarche, and psychic changes (Widyastuti, et al, 2009). Menarche is too early to be associated with risk factors for some malignant disease. According to Helm (2009), early menarche age is a risk factor for ovarian cancer, breast cancer, and myoma. This is similar to the results of research by Al Sahab (2010) that menarche is too rapid increase the risk of breast cancer and ovarian cancer (Rah, 2009). In addition, the acceleration of menarche age also increases the chances of endometrial hyperplasia (Chiang, 2008). According to Hebra (2008), cholecystitis is also associated with a faster menarche age. Later, the incidence of uterine cancer and breast cancer was also associated with age of menarche (Chiang, 2009; Swart, 2010) by hormonal reasons, which in this case was more dominated by estrogem. Research conducted by Chunyan He (2009) shows that menarche age has a risk of NIDDM as adults. Early menarche age trends also have implications for the risk of pregnancy at a younger age (Rah et al., 2009) and prolonged labor (MacKibben, 2003).

One of the factors that trigger early puberty (menarche) is the status of more nutrition or obesity can be caused by eating foods high in calories and fats including junk food types. Fat content, especially trans fat in junk food will stimulate the production of hormones that play a role in follicular maturation and estrogen formation. This hormone estrogen plays a role in the development of signs of both primary and secondary puberty (Madityas 2015).

METHODS

The research was conducted in junior high school of rural and urban area of Jember Regency. The general purpose of this study was to analyze the effect of junk food consumption on early puberty incidence in junior high school girls in Jember district. Sample selected by cluster random sampling technic. From the population unit taken by 20% (Wahab, 2013) by proportional sampling to obtain sample 88 students for junior high school in urban area and 88 students for junior high school in rural area. The research instrument used was questionnaire and food samples test in laboratory. Data analyzed by logistic regression test.

RESULTS

Table 1. Distribution of Age of Female Teenagers in Junior High School

No	Respondent Age	f	%
1.	12 years old	5	5.68
2.	13 years old	54	61.36
3.	14 years old	26	29.54
4.	15 years old	3	3.42
Total		88	100

Table 2. Distribution of Early Puberty Status of Female Teenagers in Junior High School

No	Early Puberty Status (Menarche)	f	%
1.	Early puberty	60	68.18
2.	Normal	28	31.82
	Total	88	100

Table 3. Distribution of Menarche Age of Female Teenagers in Junior High School

No	Age of Early Puberty (Menarche)	f	%
1.	8 years old	1	1.67
2.	9 years old	48	80
3.	10 years	11	18.33
	Total	60	100

Table 4. Distribution of Junk Food Consumption Patterns of Female Teenagers in Junior High School

No	Consumption Patterns of Junk Food	f	%
1.	Junk Food Consumption	72	81.81
2.	Non Junk Food Consumption	16	18.19
Total		88	100

Table 5. Distribution of The Most Common Kind of Junk Food Consumed

No	Kind of Junk Food Cunsumed	f	%
1.	Fried Chicken	19	26.38
2.	Instant Noodle	12	16.66
3.	Chicken Nugget/Sosis	8	11.11
4.	French Fries	7	9.72
5.	Others (gorengan, sempol goreng, pentol goreng, cimol)	14	19.44
6.	Ice cream/ frozen cake	1	1.43
7.	Meal from fatty meats (Meatballs)	4	5.55
8.	Pizza	3	4.16
9.	Sardines	4	5.55
Total		72	100

Table 6. Distribution of Respondent Based on Frequency of Junk Food Consumption

No	Frequency of Junk Food Consumption	f	%
1.	Often (once a day) / 4-6 times a week	44	61.11
2.	Usual (3 times a week)	20	27.77
3.	Sometimes (<3 times a week) / 1-2 times a week	5	6.94
4.	Rarely (once a week)	3	4.18
Total		72	100

Table 7. Distribution of Respondent Based on Time of Junk Food Consumption

No	Time of Junk Food Consumption	**f**	%
1.	Daytime (6.00 a.m-6.00 p.m)	52	72.22
2.	Evening (>6.00 p.m)	20	27.78
Total		72	100

Table 8. Distribution of Respondent Based on The Percentage of Fat Junk Food Consumed on Fat Total

No	Procentage Fat on Junk Food Against Fat That Consumed	**f**	%
1.	High (> 10%)	50	69.45
2.	Low (< 10%)	22	30.55
Total		72	100

Table 9. Statistical Test Results The Effect on Junk Food Consumption Patterns to Early Puberty

No	Consumption Patterns	Early Puberty Status (Menarche)				P Value
		Early Puberty		Normal		
		f	%	f	%	
1.	Junk Food Consumption	60	68.18	12	13.63	0.002*
2.	Non Junk Food Consumption	0	0	16	18.19	
Total		60	68.18	28	31.82	

Table 10. Statistical Test Result The Effect on Frequency of Junk Food Consumption to Early Puberty

No	Concumption Frequency	Early Puberty Status (Menarche)				P Value
		Early Puberty		Normal		
		f	%	f	%	
1	Often (once a day) / 4-6 times a week	39	54.16	5	6.94	0.459
2	Usual (3 times a week)	16	22.22	4	5.55	
3	Sometimes (<3 times a week) / 1-2 times a week	3	4.16	2	2.77	
4	Rarely (once a week)	2	2.77	1	1.43	
Total		60	83.31	12	16.69	

Table 11. Statistical Test Result The Effect on Time of Junk Food Consumption to Early Puberty

No	Consumption Time	Early Puberty Status (Menarche)				P value
		Early Puberty		Normal		
		f	%	f	%	
1.	Daytime (6.00 a.m-6.00 p.m)	45	62.50	7	9.72	0.248
2.	Evening (>6.00 p.m)	15	20.83	5	6.94	
Total		60	83.33	12	16.66	

Table 12. Statistical Test Result The Effect on Percentage of Fat Junk Food Consumed on Fat Total

No	Percentage of Fat Junk Food Consumed	Early Puberty Status (Menarche)				P value
		Early Puberty		Normal		
		f	%	f	%	
1.	High (> 10%)	43	59.72	7	9.72	0.001*
2.	Low (< 10%)	17	23.61	5	6.94	
Total		60	83.33	12	16.66	

Table 13. Statistical Test Result Consumption Effect on Junk Food to Early Puberty

Variable	Exp (B)	Wald	p-value	Note
Junk Food Consumption Patterns	0.156	9.782	0.002*	Significant
Frequency of Junk Food Consumption	0.000	0.419	0.495	Not significant
Time of Junk Food Consumption	0.278	1.334	0.248	Not significant
Percentage of Fat Junk Food	0.023	11.833	0.001*	Significant

Statistical test result showed that there are a significant effect between junk food consumption patterns, the percentage of fat junkfood on fat total with early puberty (menarche) on female teenagers of junior high school. While the frequency and time of junk food consumption does not affect the incidence of early puberty on female teenagers of junior high school. The statistical test results are shown in Table 4,13. While seen from the value of exponent on the pattern of junk food consumption got a value of 0.156 means that more consumed junk food have greater risk of puberty occurs. Simillary, the frequency of consumption, consumption time and percentage of fat consumed from junk food increasing the risk of early puberty. While the frequency of junk food consumption does not increase the risk of early puberty.

DISCUSSION

The result of junk food consumption pattern to early puberty on female teenagers of junior high school in rural area and urban area in Jember Regency, shows that most of female teenagers experienced early puberty both junior high school in rural area or urban area. While the results of the analysis shows that there is a significant effect between the pattern of junk food consumption to early puberty both on female teenagers of junior high shool in rural area or urban area. Early menarche is menstruation that comes earlier than 10-11 years. The biological sign of menarche is sexual maturity. In women who have experienced early menarche, her reproductive function is quick like an adult female.

This is in line with research conducted by Maditias (2015) that the consumption habits of junk food among modern children will affect in nutritional improvement. This is due to the fat content, animal protein, and trans fat present in the junk food will triggers the release of hormones that affect the occurrence of menarche and the appearance of secondary sex features in children faster than normal age. The incidence of puberty both primary and secondary before the age of 8 years and menarche rise before the age of 11 years are called early puberty.

Consumption of high-fat foods will result in fat acuumulation in adipose tissue that is positively correlated with elevated leptin levels. Leptin will trigger release of GnRH hormone which further affects FSH and LH in stimulating follicular maturation and esterogen formation. The result of this study are also in line with research conducted by Soliman et al (2014) said that there is a correlation between nutrition and the incidence of puberty. From the results that nutrition influence of the body mass index (IMT/BMI), high BMI has a tendency of high fat mass as well, high fat mass be expected increase the speed of puberty in both men and women. Large fat mass one of them can be obtained because of excessive junk food consumption pattern where have high the fat content.

The results of previous studies that not support research conducted by Paramita Saraswati and Clarissa D. Aileen (2008) on the consumption effect on fast food to menarche age. The results of this study indicate the average age of menarche is 11.4 years old with a range between 9.7 and 13.3 years old. From this study, it was concluded there was no significant correlation between the frequency of fast food consumption and menarche age, between the frequency of fast food consumption and nutritional status, beetween nutritional status and menarche age. This is different from the results of similar research conducted by Maidartati (2013) that there is no correlation between fast food consumption habits with the incidence of menarche.

According to Ong Ken (2007) that the decreased age of menarche that occured on female teenagers are caused by changes in the acceleration of growth and characteristics of weight gain. This is associated with leptin levels secreted by the adipose gland. Chronic enhancement of leptin concentrations in the periphery also promotes increased serum Luteinezing Hormone (LH), which functions for the secretion of estrogen and progesterone in the ovaries. According to Uche-Nwachi (2007), Luteinezing Hormone is a hormone produced by the pituitary gland in the anterior pituitary. The higher level of LH serum, the production of estrogen and progesterone in the ovaries will rise earlier that it should and affect the signs of secondary sex that looks faster and menarche.

The impact of puberty is too early, is a higher risk of breast cancer. This is in accordance with research by Gusti Ayu (2014) that menarche age has a significant correlation to the incidence of breast cancer in women. Similarly, the results of research by Rianti et al (2012), that the age of menarche has an active correlation to the incidence of breast cancer.

Menarche age is too early in women, is less than 12 years old causing produce to the hormone estrogen in the body to be faster. Estrogen hormone can trigger the growth of cells in certain parts of the body is not normal (Health Office of West Sumatra Province, 2014). The mechanism of the occurrence of breast cancer by estrogen expossure is still unknown exactly due to estrogen stimulation of ephitelial cell division or because it is caused by estrogen and its metabolites that directly act as mutagens that can cause cancer cells in the breast (Sandra, 2011). Early menarche age can also cause a woman to experience a premature menopause as well. This causes the exposure of estrogen hormones to decrease at a relatively young age, where as the hormone estrogen also serves to prevent heart attacks and protect the bone, so that it can lead to increased the risk of a woman to experience heart and bone disorders (Salirawati, 2014).

According Winkjosastro (2007) menstruation before the age of 11 years old will increase the risk of breast cancer by 3 times. Early maturation is associated with long exposure to estrogen and progesterone hormones that affect tissue proliferation process including breast tissue. The risk of breast cancer increases with age of menarche less than 10 years old whose exposed to progesterone and estrogen hormones that can stimulate the development of epithelial tissue of breast cells, so increasing the occurrence of breast cancer (Diananda, 2007). This is in accordance with research by Rini Indarti (2005) that the age of the first menstruation <10 years has an effect on the incidence of breast cancer with OR = 3.6 because the age of first menstruation early related to the duration of exposure of estrogen and progesterone hormone in women who affect the breast tissue. The growth of breast tissue is very sensitive to estrogen so women exposed to estrogen in a long time will have a big risk to breast cancer (Harianto, 2005). Early menstrual periods and slow menopause are associated with prolonged exposure to estrogen and progesterone in women who affect tissue proliferation including breast tissue (Maulina, et al, 2012)

The results showed no effect between the frequency of junk food consumption with early puberty incidence on female teenagers of junior high school. In addition to being influenced by money, education and parent jobs, the frequency of junk food consumption is also influenced by several things: access to food sources and food availability at home. Research Allo et al (2013) the frequency of fast food consumption, eating habits or eating patterns can describe the frequency of eating a child in a day and this depends on family eating habits at home and at school. Child dietary habit is closely related to nutrients because more often the child consumes food in a day, then the tendency to experience excess nutrients is very high. Fast food is a favorite food consumed by most children, besides eating fast food has a social value where pride when eating it. Fast food has limitations in the content of nutrients. Although the frequency consumed is often but the existing nutritional content of junk food is incomplete, so that only a large of calories.

The results of the study based on junk food consumption time that there is no significant effect between the time consumption of junk food to early puberty (menarche) on female teenagers. Time consuming food most of the respondents are in the morning and afternoon, because they usually consume junk food after they come home from school with friend while waiting for pickup or transportation to go home by buying junk food that is sold on their school. Breakfast has an effect on brain development. In a study showed that breakfast is closely related to mental intelligence. So as to give positive value to brain activity, become more intelligent, sensitive and easy to concentrate. A survey shows that children and teenagers who have breakfast with carbohydrate-rich will be more energetic, able to more attention to study, cheerful, cooperative and friendly (Larega, 2015).

The results also shows that there is a significant effect between the percentage of junk food consumed in total fat by female teenagers with the incidence of early puberty (menarche). Fat requirement for the body is about 20-30% of total energy a day with saturated fat restriction less than 10% of total energy (Hardiansyah, 2011). Fat is also a necessary nutrient for the formation of leptin, a hormone that is also important in the initiation of puberty. Leptin has a strong influence on eating behavior, thermogenesis, and neuroendocrine process. In addition, leptin acts as a hypothalamus informant of the status of calories and body fat reserves to start puberty. Leptin may affect puberty by stimulating the secretion of Insulin-like Growth Factor I (IGF-I). As well as increasing the availability of glucose. IGF-I, besides being a human growth regulator, also triggers the proliferation and differentiation of fats. IGF-I will excite GnRH and gonadotropin neurons. Increased leptin levels also result in suppression of neuropeptide Y by the hypothalamus resulting in increased Gonadotrophic Releasing Hormone (GnRH) secretion (Günther ALB, 2010).

Tuminah (2009) reported that saturated fat intake in excess of suggestions may increase LDL cholesterol and total cholesterol in the blood. The recommended fat intake according to PUGS is 10-25% of the total energy requirement in a day, and <10% comes from saturated fats. Consumption of excessive sources of saturated fatty acids can cause the dyslipidemia (Devi, 2010). High fat intake or more than a third of total calories in general increases saturated fat intake and is associated with overweight and calories. Excess fat above 20% in the body can also cause clinical problems.

CONCLUSION

The conclusion of this study is the habit of consuming junk food (type of consumption and percentage of fat consumed from junk food) affects early puberty incidence while the frequency and time of junk food consumption does not affect the incidence of early puberty. Early puberty (menarche) early leads to the risk of malignant disease (ovarian cancer, breast cancer and myomas, endometrial hyperplasia, cholecystysis, unwanted pregnancy risk and psychic unavailability). Therefore, the need for increased promotive and preventive efforts through health education to the family, especially the impact of junk food consumption on the incidence of early puberty.

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