Zinc and Probiotic Combinations: Balancing Blood Sugar and Blood Fats in Children OBES and Bows

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Abstract

The prevalence of fat and obesity in the world population increases with the times. Fat and obesity increase not only in adulthood but also in children and toddlers. This is due to the increasing social and economic status accompanied by technological advancements so that all clothing and food needs will be easier to obtain without having to spend a large amount of energy, so fat accumulation increases without significant activity which causes everyone to become fat and obese. This study aims to analyze the effect of zinc and probiotic supplementation (supplement is Lactobacillus casei) on blood sugar levels, total cholesterol, triglycerides, LDL (Low-Density Lipoprotein) and HDL (High-Density Lipoprotein). This type of research is an experiment with pre-post test design. The population is all children in the Perumnas I and IV Elementary Schools of Makassar City. The sample used was all obese and obese children as many as 8 students. The supplements used are zinc and L. casei, which are given once a day on school days. The research variable used was a serum sample derived from blood in mg/dl units and analyzed at the Tajuddin Chalik General Hospital Makassar. Data analysis uses paired t test. The results showed that there was a significant decrease in blood sugar levels while total cholesterol, triglyceride, LDL and HDL levels did not decrease significantly. Suggestions for using zinc and L. casei supplements in obese and obese children should be balanced with exercise so that triglyceride levels can drop to normal levels.

Keywords: *The combination of zinc and L. casei, blood sugar, blood grease.*

Introduction

Obesity is now an important problem in the world of health. The impact on health problems is huge. Obesity increases the risk of heart disease, diabetes mellitus (diabetes), joint disease and also cancer. If it occurs in children, obesity can also cause other problems that adversely affect the child's quality of life such as sleep disorders and impaired foot limb growth. In addition, in social life, obesity makes people feel less confident. Many people compete to go on a diet to maintain ideal body shape. It is quite difficult for someone to restore their ideal body weight when they are obese. Therefore, the intervention must actually begin when still in childhood. Several studies have shown that children and adolescents who are overweight, are twice as likely to be obese as adults compared to children who were not obese as a child. Maintaining an ideal body weight during childhood and adolescence can reduce the risk of obesity in adulthood. Unlike adults who can choose food, children and adolescents are more influenced by the environment when choosing food. In children, the main factor causing obesity is parents who provide food in excessive portions. This will cause the process of gaining weight very quickly. Parents play an important role in choosing foods to be consumed by children and regulate the daily physical activity of children. The results of research on obese and obese children who received zinc supplements showed blood sugar levels dropped significantly ($p < 0.05$), but those who used L. casei supplements dropped not significantly ($p > 0.05$) 7. Research conducted on obese and obese children who

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get zinc and L. casei significantly decreased cholesterol levels (p <0.05) on total cholesterol levels 5,6,7. For triglyceride and LDL levels the use of zinc and L. casei did not decrease significantly (p> 0.05). HDL levels in obese and obese children were significantly decreased (p <0.05) that received zinc supplements and dropped not significantly (P> 0.05) in children who received L. casei7 supplements. Based on the results of these studies whether the combination of zinc and L. casei can reduce blood sugar levels when, total cholesterol, triglycerides, LDL and HDL in a balanced way?.The purpose of this study: to analyze the effect of a combination of zinc and L. casei on the decrease in blood sugar levels when, total cholesterol, triglycerides, LDL and HDL in a balanced way.

Material and Method

This research is an experimental research with pre post test only design. This research was conducted in 2018. The population was all obese and obese students in Perumnas I and IV Elementary Schools, while the samples were grade 2 and 6 students who were obese and obese and healthy, Bugis and Makassarese, residing in Makassar City. The number of samples as many as 8 people. Primary data that is anthropometric data, nutritional intake and levels of blood sugar, total cholesterol, glycerides, HDL and LDL will be collected before and after the intervention for 1 month. Secondary data in the form of sample characteristics were collected at the same time. As much as ± 3 cc of blood drawn in the sample. After that centrifuged to get the serum. The serum was examined using Cobas C111 made by Roche to determine levels of blood sugar, Total cholesterol, Glyceride, HDL and LDL each in mg/dl units at the Tajuddin Chalik General Hospital Laboratory Makassar. The analysis test used paired 2-sample t test with the data requirements normally distributed using the Shapiro Wilk test. Data is presented in tabular form with narrative description.

Findings: The table above shows that observations on body weight, height, nutritional intake in this case intake of protein (p> 0.05), fat (p> 0.05), energy (p> 0.05) and zinc (p> 0.05) as a control variable in this study did not show differences. This shows that there is no difference in nutrient intake, body weight and height, meaning that the variable of nutrient intake and weight are controlled. Based on the results of this study indicate that.

Table 1: Distribution of Changes in when blood sugar Profile, Total Cholesterol, Triglycerides, LDL and HDL in Fat Children and Obes who Obtain Combination of Zinc and L. Casei Supplements in SD Inpres Perumnas I and IV Makassar City in 2018

Suplement	Grade (mg/dl)		t	p
	Before	After		
When blood sugar	99,88±12,62	85,88±8,95	2,98	0,021
Kolesterol Total	190,13±37,29	181,5±40,34	0,747	0,480
Trigliseride	221,37±106,52	181,5±97,96	0,967	0,366
LDL	104,75±27,32	102,03±28,72	0,356	0,806
HDL	49,25±5,65	47,63±7,52	0,492	0,638

Based on table 1 above shows that there was a significant decrease in blood sugar levels (p <0.05) from an average of 99.88 to 85.88 mg/dl, for total cholesterol levels dropped from an average of 190.13 to 181 .5 mg/dl, triglycerides decreased from an average of 221.37 to 181.5 mg/dl, LDL dropped from an average of 104.75 to 102.03 and HDL dropped from an average of 49.25 to 47.63 mg/dl which was statistically significant decrease (p> 0.05).

Discussion

The use of probiotics has long been used to make fermented milk products. Probitik is a microorganism in the form of bacteria that is given in a sufficient amount to provide health benefits to the host[15]. Bacteria that are commonly used are Lactic Acid Bacteria (BAL) for fermentation such as milk fermented foods, cheese and plant-based foods[13,14]. This is because the administration of L. casei which functions to inhibit the enzyme alpha

glucosidase found in intestinal microphiles as explained by Jain and Nerves (2010) that BAL class bacteria can act as inhibitors of the alpha glucosidase enzyme and can cause a decrease in blood glucose levels in mice so that it can applied to humans. The work of zinc also synergizes together with L. casei to reduce GDS levels in obese and obese children so that it can be used as a prevention in increasing the body's resistance in counteracting free radicals.[11] Probiotic strains of Lactobacillus casei Shirota are lactic acid bacteria that have benefits for increasing the immune system, as antioxidants and have the ability to reduce cholesterol levels. Some recent research results indicate that shows that zinc is an important nutrient in the incidence of obesity. Recent studies report that adults with a history"Yo-Yo" syndrome (gradually decreases, then gets worse)[10]. Zinc supplementation is significantly helpful[12]. In one study, zinc levels in obese and obese subjects were inversely proportional to their body mass index, this shows that the important role of zinc in the development of obesity. In general, the higher the body mass index, the lower the zinc[9]. The mechanism of cholesterol reduction can occur because the lactic acid present in yogurt can degrade cholesterol into coprostanol. Coprostanol is a substance that cannot be absorbed by the intestine. Thanks to yogurt, the coprostanol and the remaining cholesterol can be excreted with feces. In other words, the amount of cholesterol absorbed by the body becomes low. A report on this subject explained that the reduction of cholesterol by lactic acid bacteria (Lactobacillus) could reach around 27-38%[8] ·High fat consumption will increase sterols in the large intestine and increase secretion of bile salts, which will then be metabolized by bacteria in the intestine to produce carcinogenic compounds (cancer triggers). Cholesterol in food through the stomach to the duodenum and in the intestine in the triacylglycerol oil phase[16].

Bile acids are absorbed from the bottom of the ileum and back to the liver. This is hepatic circulation. Collection of bile acids in the liver approximately 3.5 grams is circulated 6-10 times per day. Every time 1%, which is about 500 milligrams/day, escapes absorption and is excreted through feces. Furthermore the body's cholesterol is secreted through the intestine by the intestinal wall. Bile salt is wasted through feces and causes more cholesterol to be needed to synthesize bile salt again, thereby reducing body cholesterol levels[17]. The results showed that there are several benefits of probiotics in the body that play a role in reducing cholesterol levels, where bifidobacteria produce niacin which contributes to the reduction in cholesterol. The cholesterol-lowering effects of lactic acid bacteria (LAB: Streptococcus, Lactobacillus and Bifidobacterium) are well known. Lactic acid bacteria are found in yogurt. These bacteria form colonies and create an environment in the digestive tract in such a way that can prevent the growth of pathogenic bacteria that enter the body. This study shows the results that LDL levels in obese and obese children do not decrease significantly if given a supplement of zinc, L casei and a combination of zinc + L.casei, if it refers to the significance value, obese and obese children who get L. casei supplements have a decrease in value the lowest significant. This means that zinc and L. casei can reduce LDL levels in fat and obese[18,19].

This is consistent with the results of research which resulted that the L. casei strain Shirota strain reduces LDL levels in rodents (mice)[20]. The results showed that high significance in overweight and obese children who received zinc and L. casei combined supplements had a significant decrease in HDL levels. Lactic acid bacteria can also prevent urinary tract infections, reduce the risk of cancer or gastrointestinal tumors and other organs, reduce blood serum cholesterol levels, reduce the risk of coronary heart disease, stimulate the formation of the immune system, help sufferers of lactose intolerance in consuming milk and facilitate the elimination of waste defecate. Lactic acid produced by bacteria with a pH value of 3.4-4 is sufficient to inhibit a number of destructive bacteria and spoilage of food and beverages. However, during the fermentation process, it not only produces lactic acid and lactobacillin. Also produced certain compounds that can increase the organoleptic value of food and drinks, including tastes and odors that invite taste and improve appearance. The process of forming cholesterol and carcinogens (tumor-triggering compounds) starts from fat which will turn into bile acids which then become a series of enzymes. Then change the carcinogen into a carcinogen, which among others triggers colon, breast, prostate and pancreatic cancer. The process of forming bile acids from fat is stimulated by fecal bacteria or coli bacteria that come from feces or feces.[2,3] But in the presence of lactobacillin, the faecal bacteria become inactive so that the process of changing fat into bile acids also stops. Another compound of lactate bacteria is NI (not yet identified or unknown). However, this compound has been known to play a role in inhibiting the formation of cholesterol. NI works by inhibiting the enzyme 3-hydroxy 3-methyl glutaryl

reductase which will convert NADH to nevalonic acid and NAD. Thus, a series of other compounds that will form cholesterol are also inhibited. Because it can be said that the presence of foods and beverages that are naturally acidified by the fermentation of lactate bacteria, can help their consumption prevent cholesterol and cancer. The role of Zn not only affects the antioxidant enzymes, but Zn[1,2]also influences blood glucose levels[2]. Several previous studies explain the administration of Zn at different doses beneficial for the blood glucose levels of hyperglycemic rats. A 2014 study gave Zn a dose of 5 mg/kg body weight (BB) in hyperglycemic mice for 3 months and proved that Zn played a role in stimulating protein kinase B phosphorylation and activating glucose metabolism so that blood glucose levels decreased[3,4].

Conclusion

By supplementing the combination of zinc and L. casei, reducing blood sugar levels when significant under normal circumstances, there was a decrease in levels of total cholesterol, triglycerides, LDL and HDL which were not significant, where the decrease in triglyceride levels had not reached normal levels. We recommend using zinc and L. casei supplements with appropriate activities and adequate fat intake.

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