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Studies of Toothpaste Detergent and Non Detergent Composition to Growth of Plaque and Saliva Secretion: The Study was Conducted to Students of Inpres Primary School Hasanuddin University, District Tamalanrea Jaya, Village Tamalanrea Municipality Makassar

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Abstract: ***Oral hygiene is strongly influenced by the amount of their volume of salivary secretion secreted by glands continuously salivarius which serves to maintain the normal balance of microorganisms in the mouth flora; maintain normal PH saliva (buffer capacity); maintaining bio immune mechanisms; and help the digestion of food early stage by enzymatic process. The magnitude of the volume of saliva secreted continuously as mentioned above is influenced by several factors, among others, such as the olfactory stimuli (neuronal); The biochemical stimuli in the form of consumption of drugs and the use of toothpaste good detergent and toothpaste non detergent. The purpose of this study was to determine whether there is difference in the growth of plaque and salivary secretion in the toothpaste detergent and non-detergent in the Instruction Unhas elementary students Tamalanrea Jaya subdistrict. This study is a qualitative research method Quase experimental studies with this type of research design Pre and Post-test design with control group.Based on data obtained from the results of SPSS, showed that students who use the picture difference toothpaste detergents and non deteregen different, where the students are using toothpaste detergent and non-detergent is 0.52 and while in the salivary secretion produced there are also differences at the toothpaste detergent and non-detergent that is 0,000. Based on research conducted by the researchers, it can be concluded that students who use a toothpaste containing a detergent can accelerate the growth of plaque and can also reduce the secretion of saliva than students who use toothpaste that non detergents due to toothpaste detergent containing Sodium Lauryl Sulfate which can cause dry mouth.***

Keywords: Toothpaste; Sodium lauryl sulfate; Saliva secretion and the growth of plaque

1. Introduction

Healthy is an essential things of life to get a strong generation. Besides health also aim to raise awareness, willingness, and ability to live a healthy life in order to materialize the public health optimal.According toRisetKesehatanDasar (RISKESDAS) Nasional in 2007 among the diseases that complained and complained, the prevalence of dental and oral diseases in South Sulawesi was 25.3% of the population. It can be seen from the prevalence rate of brushing their teeth every day residents of the South Sulawesi was 88.7%.[1]

One of the indicators of oral health is the level of oral hygiene. It can be seen from the presence or absence of organic deposits such as pellicle, material alba, food scraps, calculus and dental plaque. Plaque is a soft deposit which forms a layer of biofilm and firmly attached to the surface of the teeth and gums and other hard surfaces in the oral cavity.Mechanical exhaust can be done by brushing. Brushing teeth is a daily activity for each person at least twice a day. Most of them use toothpaste to brush their teeth. [2]

Gel Dentrifice or commonly known as the toothpaste is used to clean teeth from leftovers to remove plaque and bad breath as well as beautify the aesthetic appearance of teeth. Each toothpaste contains ingredients that are important such as abrasive materials, fluoride, tooth whitening, flavoring materials and binders.[3]

But unnoticed in the Modern Age is a lot of toothpaste that should give a sense of security to users but contains hazardous materials such as detergents or substances excessive foaming. Moreover, if used excessively in children which would memberika irritating effect on the oral cavity children.

The foaming ingredient is Sodium Lauryl Sulfate. SLS one of the synthetic detergents are most widely used in toothpaste. In general, surface active materials reduce the surface tension, penetrate and loosen deposits and emulsion or suspend debris dentrifice eliminate from the booth. concentration in the toothpaste market typically range from 1.5 to 5.0%. SLA is a chemical used as detergents in the car wash soap, floor cleaner, shampoo, soap, and toothpaste.[3]

The function of the SLS is actually to lower the surface tension of the solution so as to reduce the surface tension of

the solution so as to dissolve the oil and form a microemulsion forming foam.[3]

However, based on research conducted BenteBrokstadHerlofson and Barkvoll of the Department of Oral Surgery and Oral Medicine, Dental Faculty, University of Oslo, Norway compared the effects of the use of toothpaste with detergent and detergent-free.

The purpose of the clinical study to examine the effects of the type of toothpaste to use detergent containing Sodium Lauryl Sulfate and CocoAmidoPropylBetaine compared with toothpaste-free detergent in 30 patients with recurrent mouth Aphthous Ulcers (RAU) or wounds such as ulcers continuous.

The study for six weeks. In that period, patients were asked to brush their teeth twice a day with two different types of toothpaste. From these results can be assessed locations and the number of ulcers that look.

The higher frequency significantly from the appearance of sores in the mouth is indicated when a patient brushing your teeth with toothpaste containing Sodium Lauryl Sulfate (SLS), compared with a toothpaste containing CocoAmidoPropylBetaine (CAPB) or detergent-free toothpaste.

From the research of the united states said when brushing your teeth with a toothpaste containing Sodium Lauryl Sulfate before consuming grapefruit juice would cause a bad taste supposed orange juice tasted sweet. [3]

In addition, by using toothpaste that berdeterjen will affect the amount of saliva in the oral cavity. By using detergent toothpaste mouth will feel dry and rough compared with the use of non-detergent toothpaste.

2. Research Methods

This type of research is experimental Quase. This study design using pre and posttest design with control group. Time doing research in February-March 2013.In this study, all members of the population taken as research objects. The number of subjects to be studied at the pupils in primary PI Hasanuddin University, Village Tamalanrea Jaya, DistrictTamalanrea Makassar municipality is 30 people. The location of research in primary PI Hasanuddin University Village Tamalanrea Jaya, District municipality Tamalanrea Makassar.

Criteria for the sample is divided into two, namely the criteria for inclusion and exclusion criteria. Inclusion criteria, ie the sample is present and willing to participate when the study was conducted. Exclusion criteria, namely tooth crowding, not willing to participate in research, and does not have a permanent incisor or molar. Tools needed in this research is the mirror, sonde, tweezers, glasses, nierbecken, toothbrushes, stationery, masks, centrifuge tubes and Handschoen. Materials used in this research is disclosing solution, alcohol 70%, water, toothpaste, and cotton.

Variables examined is divided into three, namely the independent variable, the variable liaison, and the dependent variable. The independent variables, which is free (toothpaste composition detergent and non-detergent), moderator (brushing), random (brushing frequency), and control (old brushing teeth). Variable liaison, namely the decline in plaque and saliva secretion. While the dependent variable, namely the growth of plaque and saliva secretion.

This research procedure requires a sample of 50 people. Then, the sample was divided into two groups between the group using toothpaste detergent and non detergent. Then, the first thing done is asked to brush their teeth samples that contain detergents. Then check the growth of plaque and the amount of saliva. Further samples directly observed and measured to evaluate the amount of volume of saliva. Type of this research is the primary data. Processing data using SPSS. The data analysis of this research is an Independent T test with the presentation of data through a table.

3. Results

Obtained a total sample of 49 people with the details of 26 grade III and 23 grade VI pupils in accordance with the inclusion criteria, then the samples are grouped into two groups. The first group was asked to brush their teeth with toothpaste detergent and the second group was asked to brush their teeth with toothpaste non detergent. The first samples were examined the volume of saliva and plaque growth before brushing the teeth after which the samples are directed to brush their teeth with a toothpaste suitable group for a week, then re-examined samples of saliva and index volume plaknya. Once all the data has been obtained subsequently processed using SPSS. Values obtained were then given an independent T test statistical test. Data were presented in tables as below.

Table 1: Distribution of the mean and the value of saliva and plaque volume by sex Report

Sex	Grou[p		Saliva_1	Saliva_2	Plaque_1	Plaque_2
Male	Detergent	Mean	1.6400	1.5500	1.2940	1.5110
N	10		10	10	10	
Std. Deviation	.36576		.33417	.42911	.38205	
Non Detergent	Mean		2.1167	2.1500	1.0083	1.1475
N	12		12	12	12	
Std. Deviation	.22896		.22361	.37399	.35082	
Total	Mean		1.9000	1.8773	1.1382	1.3127
N	22		22	22	22	
Std. Deviation	.37922		.40933	.41639	.40168	
Female	Detergent	Mean	1.1938	1.3688	1.2231	1.5563

N		16		16		16		16
Std. Deviation		.43584		.33009		.44803		.44706
Non Detergent	Mean		1.9273		2.0727		1.3173	1.4918
N		11		11		11		11
Std. Deviation		.26867		.31652		.34557		.32474
Total	Mean		1.4926		1.6556		1.2615	1.5300
N		27		27		27		27
Std. Deviation		.52178		.47502		.40492		.39612

Based on Table.1 shows the distribution characteristics of the sample totaling 49 people. Consists of 22 boys and 27 girls. In the results obtained by the comparison value amount of saliva boys on the toothpaste detergent is smaller than the male students of non detergent toothpaste is 1.55 ± 0.33 while the girls the same thing happen saliva comparison pasta user pupils tooth detergent is smaller than the toothpaste non detergent was 1.37 ± 0.33 by contrast, the growth of plaque on the boys' toothpaste detergent, plaknya relatively faster growth compared with non users toothpaste detergent that is 1.51 ± 0.38. Likewise with female students at the toothpaste detergent plaknya relatively faster growth compared with non-users toothpaste detergent that is 1.56 ± 0.45. It is seen that in the toothpaste detergent decreased salivary secretion and plaque growth occurs.

Table 2: Comparison of saliva before and after the group toothpaste detergent

Paired Samples Test							
Paired Differences			T		Df	Sig. (2-tailed)	
Mean		Std. Deviation		Std. Error Mean		95% Confidence Interval of the Difference	
Lower				Upper			
Pair 1 Saliva_1 -Saliva_2	-.07308	.21458	.04208	-.15975	.01360	-1.736	25	.095

P>0,05 not signified

According to the Table.2 P value calculated for groups of saliva before and after the toothpaste detergent is 0.095. Table.2 test values in the table above shows that the group with toothpaste detergent on the amount of saliva before and after there was no significant difference.

Table 3: Comparison of saliva before and after the group toothpastes non Detergents

Paired Samples Test								
Paired Differences			t		Df	Sig. (2-tailed)		
Mean		Std. Deviation		Std. Error Mean		95% Confidence Interval of the Difference		
Lower				Upper				
Pair 1 Saliva_1 - Saliva_2	-.08696	.14864	.03099	-.15123	-.02268	-2.806	22	.010

P>0,05 not signified

According to the Table.3 P value calculated for groups of saliva before and after the non detergent toothpaste is 0,010. Table.3 test values in the table above shows that the group with non-detergent toothpaste on the amount of saliva before and after there was no significant difference.

Table 4: Comparison of plaque before and after the group toothpaste detergent

Paired Samples Test								
Paired Differences			T		Df	Sig. (2-tailed)		
Mean		Std. Deviation		Std. Error Mean		95% Confidence Interval of the Difference		
Lower				Upper				
Pair 1 Plaque_1 - Plaque_2	-.15609	.07408	.01545	-.18812	-.12405	-10.104	22	.000

P>0,05 not signified

According to the Table. 4 P value calculated for groups of plaque before and after the toothpaste detergent is 0.000. Table. 4 test values in the table above shows that the group with toothpaste detergents on the value of the plaque before and after showed a significant difference.

Table 5: Comparison of plaque before and after the group toothpastes non detergents

Paired Samples Test								
Paired Differences			T		Df	Sig. (2-tailed)		
Mean		Std. Deviation		Std. Error Mean		95% Confidence Interval of the Difference		
Lower				Upper				
Pair 1 Plaque_1 - Plaque_2	-.28846	.17941	.03519	-.36093	-.21599	-8.198	25	.000

P>0,05 not signified

Based on Table. 5 P value calculated for groups of plaque before and after the group of non-detergent toothpaste is: 0,000. Test values in Table. 5 above shows that the group with non-detergent toothpaste on the value of the plaque before and after showed a significant difference.

Table 6: Comparison of saliva after the group toothpaste detergents and non Detergents

Independent Samples Test									
Levene's Test for Equality of Variances			t-test for Equality of Means						
F	Sig.		T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
Lower					Upper				
Saliva_2 Equal variances assumed	.617	.436	-7.678	47	.000	-.67458	.08786	-.85133	-.49783

Group	N	Mean	Std. Deviation	Std. Error Mean
Saliva_2	Detergent 26	1.4385	.33714	.06612
Non Detergent	23	2.1130	.26850	.05599

P>0,05 not signified

Based on Table. 6 P value calculated for a group of saliva in toothpaste detergents and non detergjen is: 0,000. Test values in Table. 6 above showed that the group with toothpaste detergent showed a significant difference to the group of non-detergent toothpaste on a total volume of saliva.

Table 7: Comparison of plaque after the group toothpaste detergent and non-detergent

Samples Test								
Levene's Test for Equality of Variances				t-test for Equality of Means				
F	Sig.		T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
Lower					Upper			
Plaque_2 Equal variances assumed	1.100	.300	1.994	47	.052	.22667	.11368 -.00203	.45537
Equal variances not assumed	2.007		46.980	.051	.22667	.11295	-.00055	.45390

Group	N	Mean	Std. Deviation	Std. Error Mean
Plaque_2	Detergen 26	1.5388	.41590	.08156
Non Detergent	23	1.3122	.37470	.07813

P>0,05 not signified

Based on Table. 7 P value calculated for the group plaque toothpaste detergent and non-detergent is 0.052. Test values in Table. 7 above shows that the group with toothpaste detergent showed no significant difference with the group of non-detergent toothpaste on the amount of plaque value.

4. Discussion

This research has conducted to showing the effect of toothpaste detergent and toothpaste non detergent on the growth of plaque and saliva volume. Samples were taken at Basic School Instruction Hasanuddin University Village Tamalanrea Jaya subdistrict Tamalanrea Class III and Class VI included in the inclusion criteria. All students of class III and class VI that meet the criteria are then directed to brush her teeth with toothpaste and then examined the volume of saliva and plaque growth on the student. Sampling was done by using a tube centrifuge to measure the volume of saliva by using the draining method, as well as the use of oral hygiene index simplified by examining the molars of the upper jaw left and right on the palatal surface, incisor the right side of the upper jaw on the labial surface of the molars the lower jaw to the left and right on the buccal surface, as well as the incisors left and right on the labial surface to examine the plaque index of the sample. Obtained a total sample of 49 people with the details of 26 grade III and 23 grade VI in accordance with the inclusion criteria, then the samples are grouped into two groups.

The first group was asked to brush their teeth with toothpaste detergent and the second group was asked to brush their teeth with toothpaste non detergent. The first samples were examined the volume of saliva and plaque growth before brushing the teeth after which the samples are directed to brush their teeth with a toothpaste suitable group for a week, then re-examined samples of saliva and index volume of plaque.

Once all the data has been obtained subsequently processed using SPSS. Values obtained were then given an independent T test statistical test. The samples were divided into two groups: group toothpaste detergent, totaling 26 students and also non detergent toothpaste 23 pupils. Based on Table. 1 see the difference between the samples of toothpaste detergent and non-detergent based on sex where the sample male has a number of relatively more saliva than women sampled were the case with plaknya growth. Based on Table. 2 wherein prior to treatment and after treatment there is a difference in the saliva with the use of toothpaste detergent that is 0,004. While on the Table. 3 on a sample of the non detergent toothpaste obtained value P 0,010 where

there is no significant difference. Comparison of the growth of plaque in the Table.4 and Table.5 before and after the treatment was given after meggosok tooth in accordance with toothpaste given the apparent difference of 0,000 where the samples using toothpaste detergent plaknya growth faster than the samples of toothpaste non detergent.Shown in Table. 6 on a comparison of the volume of saliva in groups of toothpaste detergent and non-detergent, toothpaste seen for non detergent more salivary secretion compared with non-users toothpaste detergent. This shows a significant difference, amounting to 0,000. And on the table. 7 the comparison of the number of plaques there are also significant differences between users and non detergent toothpaste detergent which is equal to 0.052.

This is where in accordance with the results of research conducted by According to research conducted by Handajani, J (2012), Al Supartinah (2012), General, A (2012) showed that the toothpaste containing enzymes have antibacterial against Streptococcus Alpha degan starts at 5% concentration. [6] The results of the study the effects of the use of toothpaste enzyme on the growth of dental plaque showed a significant fall. This is because the ability of antibacterial laktoperoksidasenya system, which is able to transform into hipotiosianatthiocyanate. Hipotiosianat this will act as an antibacterial with the interaction glycolitic oxidation-reduction enzyme-containing thiol group essential that kill bacteria Streptococcus on dental plaque. Besides the enzyme lysozyme contained in toothpaste capable of invading bacteria by attacking the cell wall so that it becomes porous and bacteria cells lose fluid, then lead into a dead bacteria. This enzyme function effectively as an antibacterial when cooperating with lactoferrin and Serum immuno-globulin A. In this study, toothpaste detergent shown to influence the growth of plaque in comparison with toothpaste non detergent, and toothpaste detergent shown to inhibit the secretion of saliva compared to the wearer toothpaste non detergent was caused because of the content of Sodium Lauryl Sulfate in toothpaste detergent inhibiting the secretion of saliva , As well as research conducted by According to Wiseman in 1970.

The content of Sodium Lauryl Sulfate in toothpaste that can be tolerated by saliva is 0.0001%, while the market there is a range between 1%-5%. Use of Sodium Lauryl Sulfate overload can cause a decrease in saliva solubility and changes in sensitivity rasa.dan cause dryness of the oral cavity.

5. Conclusion

Based on research conducted by the researchers, it can be concluded that students who use a toothpaste containing a detergent can accelerate the growth of plaque and can also reduce the secretion of saliva than students who use toothpaste that non detergents due to toothpaste detergent containing Sodium Lauryl Sulfate which can cause dry mouth.

6. Suggestions

Advice can be given after conducting this study are best advised to use toothpaste that does not contain detergents in maintaining oral hygiene due to plaque growth was slow. In addition, it is expected from an early age children are taught to be diligent in brushing your teeth to maintain oral hygiene. In addition, it is also necessary that further studies with sample number and location more and more time.

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