Proceeding of The 14th FDI-IDA Continuing Dental Education Programme

"Advancing Dentistry with Innovative Sciences and Technology"

Novotel Manado Convention Center, Manado September 20-22, 2018

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RESEARCH

Correlation Between Salivary Acidity Level to Gingival Inflammation in The Elderly People

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Abstract

Introduction :_Elderly is a man or woman over 60 years old. Generally in the elderly began a loss of a lots teeth and gum damage due to the regeneration process. Both of these things greatly affect the process of mastication. Elderly would be difficult to consume hard-foods consistency, salivary glands began difficult to be secreted, the tongue as a lubricant began to diminish its function and lack of protein is often associated with degeneration of connective tissue gingiva. Objectives: Aim of this study to analyze the correlation between salivary acidity level to gingival inflammation in elderly people. Method: This research is a cross sectional study and, was conducted in May 2015 with a total sample of 41 elderly people in Lemoh Tombariri Minahasa District. Sampling technique was accidental sampling, Saliva acidity examination using saliva pH examination format and gingival examination using gingival index (GI) examination format. The obtained data were analyzed using Pearson correlation test. Result: The result showed that 27 respondents (65.9%) had moderate inflammation, and the elderly with severe inflammation were 14 respondents (34.1%). the lowest salivary pH value was 5.2 and the highest salivary pH value was 6.6 with mean of 5.893. Pearson correlation test results showed that the correlation between salivary pH score and Gingival Index score was significant. The Pearson correlation value of - 0.452 indicates a negative correlation with a moderate correlation strength. Conclusion : The lower the salivary pH value, gingival inflammation would be increase in elderly people.

Keywords: elderly, ph saliva, gingival index.

Introduction

In elderly, many teeth are dated and gum damage occurs due to regeneration process. Both of these things greatly affect the process of chewing food. Elderly will be difficult to consume food consistency hard. Salivary glands also began to be secreted by the function of the tongue as a lubricant was reduced so that the process of swallowing becomes more difficult and tasting function also decreased because papilla on the tip of the tongue decreased its function.

Protein deficiency is often associated with degeneration of gingival binding tissues, periodontal membranes and mucosal support of artificial teeth.[1] _Periodontium in toothless elderly people has the capacity to survive, overcome and repair damage caused by periodontal disease, beyond age-related changes that indicate susceptibility-enhancing.[2] Previous study in USA shows that approximately 60% of the population aged 65 and older still have partial tooth, with an average of 19 existing teeth. Of the samples selected in this investigation, 90% require periodontal treatment of several types such as oral hygiene instructions, skelling and root treatment for 3-6 mm deep pockets. only 1% of this patient's cohort experienced gingival bleeding and a periodontal pocket larger than 6 mm. Another American study, showing that

age is not directly related to the following parameters: the presence of gingival inflammation, plaque accumulation and calculus, gingival recession and periodontal pocket depth[2].

Gingiva is part of the outer periodontal tissue. Gingiva is often used as an indicator if the periodontal tissue is affected by the disease. This is caused because most periodontal diseases start from the gingiva, sometimes gingiva can also describe the underlying alveolar bone.[3] According to Manson and Eley (2004), the function of the gingiva is to protect the tissue under the attachment of the tooth to the environmental influences of the oral cavity. Like all other vital tissues, the gingiva can adapt to environmental changes. Gingival defense mechanisms include: 1) Saliva flow and salivary content eg lysozyme. and immunoglobulin A., 2) cell turnover and surface desquamation. 3) immune mechanism activity.[7]

Saliva in the oral cavity plays a role as host and influences the occurrence of dental caries, ie saliva flow serves to clean teeth from food scraps in the oral cavity and resist acid attacks produced by bacteria in plaque.[4] The degree of acidity of a solution is expressed by pH. This is the negative logarithm of the concentration of H + (-Log [H +]) which is at 250C for a neutral solution equal to 7. The pH scale is expressed in reverse ratio, where the lower the pH value the more acid is in the solution. Conversely, an increase in pH value means the addition of a base in solution. At pH 7, there is no acidity or alkaline solution and is called neutral. The saliva is in good condition. The pH is about 6.8-7.8.[5] The degree of acidity (pH) of saliva is an important factor that plays a role in dental caries, periodontal abnormalities, and other diseases in the oral cavity. The normal salivary acidity (pH) level in the mouth is at 7 and if the salivary pH value falls ≤ 5.5 it means that the condition is very critical.[5] The salivary pH value is inversely proportional, wherein the lower the pH value the more acidic the solution is, the higher the pH value means the increase of base in the solution. At pH 7, there is no acidity or alkaline solution, and this is called neutral. Bacterial growth occurs at optimal salivary pH ranging from 6.5 to 7.5 and if the oral cavity of low salivary pH (4.5-5.5) will facilitate the growth of asidogenic germs such as *streptococcus mutans* and *lactobacillus*.[3] The aim of this study to analyze the correlation between salivary acidity level to gingival inflammation in elderly people.

Methods and Materials

The type of research is analitic cross sectional study, the study was conducted in May 2015 with a total sample of 41 elderly people in the village of Lemoh Tombariri Minahasa District.

Gingival Index

Gingival examination using Gingival Index (GI) Loe and Sillness, The gingiva surronding each tooth is divided into following four scoring units : Distofacial papilla, Facial gingival margin, Mesiofacial papilla and Lingual gingival margin. Scoring is done on basis of gingival inflamation (table.1) [6,7]

Each Surface is given a score, and then the scores are totaled which gives the scores for area and divided by four gives score for the tooth. Totaling all scores and dividing by number of teeth examinated provides GI score per person.[8] The numerical scores of gingival index show the degree of clinical gingivitis (table.2)

Table.1. Scoring Criteria (GI)

0	Normal gingiva without inflammation
1	Mild Inflammation, slight change in color and texture. No bleeding on palpation with blunt explorer
2	Moderate inflammation, shinny redness, edema and bledding on very slight and light palpation with blunt explorer
3	Severe inflammation, marked shinny redness, edema.ulceration, and spontaneous bleeding on very sliht and light palpation with blunt explorer

Table.2. Interpretation of result (GI)

Clinical Conditions	Score
Mild Gingivitis	0,1 - 1,0
Moderate Gingivitis	1,1 - 2,0
Severe Gingivitis	2,1 - 3,0

pH Saliva

pH saliva measurement was using pH test strip. Instruct the subject to expectorate any pooled saliva into collection cup. Take a pH test strip, place this into the sample of resting saliva for 10 seconds, and then check the color of the strip. This should be compare with the testing chart. Highly Acidic can range between 5.0 – 5.8, Moderate Acidic can range between 6.0 – 6.6 and healthy saliva > 6.8.

Statistical Analysis

Data management and statistical analysis were carried out using Statistical Package for Social Science version 21.0 (SPSS inc) Gingival index and pH saliva were presented using frequency distributions table. Correlation between two variable was analyzed using Pearson correlation test.

Results

Subject Characteristic

Characteristics of respondents by age and gender, can be seen from table 3 below:

Table.3. Characteristics of Respondents by Age and Sex

Age	Number	(Percentage %)
60-65 years	13	31,70
66-70 years	10	24,39
71-75 years	10	24,39
76-80 years	8	19,51
Sex		
Male	21	51,22
Female	20	48,78
Total	41	100

The age of the respondents was 60-65 years old as many as 13 respondents (31.70%) and viewed from the gender, the largest percentage of male gender were 21 respondents (51.22%)

Distribution of Respondents based on Gingiva Inflammation
The distribution of respondents based on gingival inflammation can be seen in table 4 :

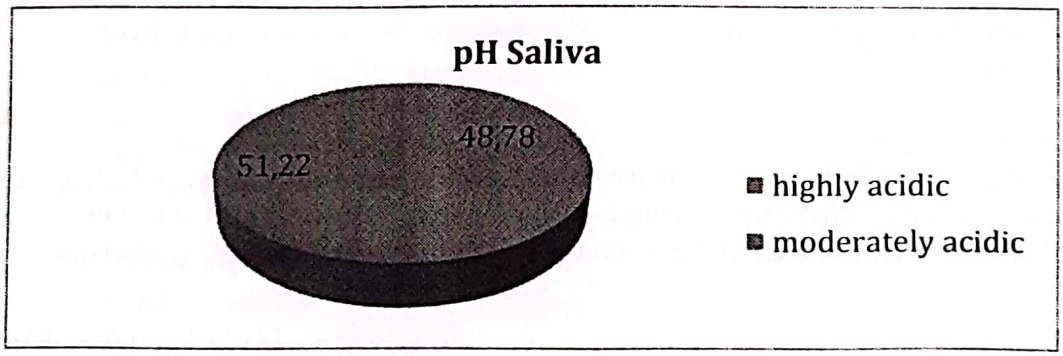
Table 4 : Distribution of respondents based on Gingival Inflammation

Clinical Condition	Number	Percentase (%)
Mild Gingivitis	0	0
Moderate Gingivitis	27	65,85
Severe Gingivitis	14	34,15
Total	41	100

The largest percentage was on moderate gingivitis with 27 respondents (65,85%).

Distribution of respondents based on salivary pH
Distribution of respondents based on pH saliva can be seen in Fig. 1 below:

Fig.1 Distribution of respondents by pH Saliva



In Fig. 1 showed that 51,22 percen respondent was moderately asidic.

Correlation between pH saliva to ginginval Index
Correlation between pH saliva to gingival enlargement in elderly people shown in table 5 :

Table.5 Correlation between pH Saliva and Gingival Index

pH saliva	Gingival Index						total	
	Mild		moderate		Severe			
	n	%	n	%	n	%	n	%
High asidic	0	0	10	24.4	10	24.4	20	48.8
Moderate asidic	0	0	4	9.8	17	41.5	21	51.2
Total	0	0	14	31.4	27	65.9	41	100

The largest percentace was at moderate asidic with gingivitis criteria of severe gingivitis index ie 17 respondents (41.5 %). Analystic test result using Pearson Correlation test showed in table 6.

Table 6. Statistic result using Pearson Correlation test

		Gingival Index
pH saliva	r	- 0.542
	p	0.003 > 0.001
	n	41

Table.6 showed obtained sig value 0.003 which indicates that the correlation between saliva pH and gingival index is not meaningful. Pearson's correlation value - 0.542 shows a negative correlation with a moderate correlation strength.

Discussion

The elderly are residents 60 years of age or older. Indonesia is included in the top five most elderly countries in the world. Based on the populatiobs census in 2010, the number of elderly in Indonesia is 18.1 million people (76 % of total population). The consequences of increasing the propotions of elderly cause problems thar required serious treatment. Increasing the number of elferly affect their life aspect such as occurance of physical, biological, phychological, and social changes as a result of the aging process or emergence of degerative diseases due to the aging.process.[9]

Clinical features of oral mucosal tissue in elderly people are not much different from younger individuals, but the history of trauma, mucosal disease, and glandular disturbances can change the clinical picture. These structural changes are accompanied by smooth, dry, thin-looking surfaces and mucosal elasticity. These changes increase the predisposition of mucosa to trauma and infection. Occurrence of additional connective tissue papillae and decreased epithelial keratinization. Decreased and reduced gingival epithelial keratinization occurs with age. The gingival recession that occurs in the elderly is not a definite physiological peroses, but is the result of periodontal trauma such as brushing too hard.[10]

Based on the data in table 4, The largest percentage was on moderate gingivitis with 27 respondents (65,85%). This situation is caused by the OHI-S is bad because of counseling or health promotion on how to maintain oral health, especially gingiva health should be done by dental health personnel in the area has not been done, and their habit of just brushing once a day even there who do not brush teeth the same time.

Figure 1 shows that saliva acidity in elderly people, the greatest percentage of moderate acidity is 27 respondents (51.2%). This is caused by increasing the age, as people get older, there is a significant decrease in salivary secretion which will make in depressed pH for a long time,[3] and also can be caused due to degerative diseases such as hypertension and diabetes mellitus.[5]

Furthermore, in Table 5 the largest percentace was at moderate asidic with gingivitis criteria of severe gingivitis index ie 17 respondents (41.5 %), it showed that the role of saliva in the digestion of food is very important in terms such as the influence of buffers, especially on the use of food and beverage ingredients.

The statistic result in table.6 showed obtained sig value 0.003 which indicates that the correlation between saliva pH and gingival index is not significant. Pearson's correlation value - 0.542 shows a negative correlation with a moderate correlation strength. It showed that the higher the degree of salivary acidity the higher the level of inflammation of the gingiva.

According to Watuna et al (2015) study, the results of the study of oral cavity conditions in elderly people with gingival recession as much as (46.66%), who bleed to the gingiva (36.66%), this occurs because the severity of periodontal disease increases with someone's age.[11] The management of the elderly is very much related to the general changes that accompany old age, the treatment is shown to eliminate adverse local changes that occur in the mouth tissue due to the age of the patient, in this case the periodontal periodontal disease tissue in the top 2 of gingivitis and periodontitis. This network as a whole is influenced by age changes. [2]

Conclusion

The correlation between saliva pH and gingival index is not significant. The higher the degree of salivary acidity the higher the level of inflammation of the gingiva. The lower the salivary pH value, gingival inflammation would be increase in elderly people. The result suggested that in elderly people should pay attention to food intake and dental hygiene and oral mucosa.

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