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GINGIVAL STATUS AT PUBERTY OF STUDENTS CLASS VII SMP

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Abstract

Inflamed gingival tissue is caused by poor oral hygiene resulting in plaque forming on the part of the tooth that borders the edge of the gum. Increased levels of endocrine hormones during puberty cause vasodilation of blood vessels resulting in increased blood circulation in the gingival tissue thereby exacerbating inflammation in the gingiva. The purpose of this study was to determine the status of gingiva during puberty of the rest of class VII SMPN 01 V Koto Kampung Dalam Padang Pariaman Regency. This study uses descriptive research methods. The population in this study were VII grade students of SMPN 01 V Koto Kampung Dalam Padang Pariaman Regency as many as 112 students and a sample of 82 respondents who had experienced puberty. The sampling technique is *purposive sampling*. How to collect data by examining the gingival index. The tools used for data collection are WHO periodontal probe, mouth glass, tweezers, nierbeken, informed consent, puberty determinant format and gingival index examination format. Data analysis used is univariate analysis. The results showed that out of 82 respondents, the results of healthy gingival criteria were 0%, mild inflammation criteria 45.1%, moderate inflammation criteria 50%, and severe inflammation criteria 4.9%. The conclusion of this study is that out of 82 respondents, many experienced moderate inflamation of the gingiva condition by 50% (41 people) and based on gender, men experienced gingival inflammation by 56.1% and women by 43.9%. It is recommended for respondents to brush their teeth at least twice a day, namely in the morning after breakfast and at night before bed and routine dental health control 1x6 months to dental and oral health services. It is recommended that health workers provide oral health counseling, especially about gingival health to respondents.

Keywords: Gingival Condition, Puberty, Junior High School Students.

1. INTRODUCTION

Teeth are hard tissue in the oral cavity, while the gingiva or gums are soft tissue in the oral cavity. The gums cover the neck of the teeth in the upper jaw and lower jaw which functions to protect the tissue under the tooth attachment against the influence of the oral environment (Tarwoto et al, 2010). Tissues in the gums that experience inflammation or inflammation are called gingivitis, which is caused by poor oral hygiene so that plaque forms on the part of the tooth that borders the edge of the gum. Plaque containing many bacteria will cause infection in the gums. Gingivitis is characterized by changes in the color of the gums starting to redden, the gums are inflamed and bleed easily (Pertiwiningsih, 2016).

Dental health problems in Indonesia besides dental caries also include gingivitis, one of which is characterized by bleeding gums when brushing teeth. Based on the 2018 National Riskesdas data, the prevalence of bleeding gums in Indonesia was 13.9%, while in West Sumatra Province the prevalence of bleeding gums reached a level of 17.1% (Kemenkes RI, 2018). The results of West Sumatra Province Riskesdas data in 2018 stated that the prevalence of bleeding gums in Padang Pariaman Regency reached a level of 17.57% (Kemenkes RI, 2018).

The cause of gingivitis is due to the process of gingival inflammation caused by local and systemic factors. Local factors cause inflammation due to plaque deposits (Nuraskin, 2021). According to (Firani et al, 2020) plaque is a thin film that forms on the surface of teeth with poor oral hygiene. Some local factors can also contribute to plaque formation, such as crowding of

teeth (dental malposition) that makes plaque removal difficult. Dental malposition sometimes requires orthodontic correction, which adds to the difficulty of plaque removal. Poorly fitted dental prostheses can lead to plaque retention. The second factor that causes gingivitis is systemic factors, which control the tissue response to local factors, so the effects of local irritants can be exacerbated by systemic conditions, for example the influence of hormones during puberty, pregnancy, menopause, vitamin deficiency, diabetes mellitus. Genetic, nutritional, hormonal and hematologic factors. One of them is hormonal that occurs in pubertal adolescents (Nuraskin, 2021).

Based on epidemiological research shows that the prevalence of gingivitis is close to 100% at the time of entering puberty, and will decrease with age and past puberty (Willayanti & Sjarif HE, 2017). The pubertal adolescent group is vulnerable at the age of 12-14 years. During puberty, gingivitis becomes a common occurrence, this condition is known as pubertal gingivitis. Pubertal gingivitis occurs due to an increase in endocrine hormones during puberty, where there are estrogen hormones in women and testosterone hormones in men (Ari, Kamelia & Miko, 2018).

Every individual generally experiences gum inflammation with varying severity according to age, gender, social status, economy, education level, and so on (Kusumawardani, 2011). Income and education are factors that affect oral health, because in meeting the needs of life and to get the desired service place is more likely for groups that have high levels of income and education compared to groups that have low income and education (Suryani. L, 2020). Socio-economic conditions determine the opportunities and choices available to a person, as well as the behavior taken to encourage maintaining oral health (WHO, 2022). Based on gender, women are more susceptible to gingivitis than men, because women grow 2 years earlier than men (Shoumi et al, 2021). The eruption time of maxillary and mandibular permanent teeth varies in each individual. In general, the eruption time of girls' teeth is faster than boys so that the teeth in girls stay longer in the oral cavity (Primasari, A, 2018). Sutclife conducted a survey in children aged between 11-17 years, and found that the prevalence of gingivitis decreased with age in both boys and girls. Treatment of pubertal gingivitis is directed at improving oral hygiene, removing local irritating factors, restoring cavities, and improving diet to ensure adequate nutrition (Willyanti, S, et al, 2017).

Based on the 2018 National Riskesdas data, the proportion of oral health problems in the population aged 3 years and over according to the characteristics of the age group 10-14 years who experience bleeding gums such as when brushing teeth in Indonesia is 14.3%, and in West Sumatra Province it is 16.62%. Based on gender characteristics, the proportion of bleeding gums in Indonesia in males amounted to 13.5% and in females reached 14.2%, while based on gender characteristics in West Sumatra Province who experienced bleeding gums in males amounted to 15.45% and females reached a figure of 18.70% (Ministry of Health, 2018).

2. METHODOLOGY

This research is quantitative research with descriptive research methods. The research was conducted on VII grade students of SMPN 01 V Koto Kampung Dalam Padang Pariaman Regency on January 11-12, 2023. The population of this study were VII grade students of SMPN 01 V Koto Kampung Dalam Padang Pariaman Regency as many as 112 people. The sampling technique in this study was purposive sampling, namely sampling with the specified criteria, namely women who have experienced menstruation, men who have experienced wet dreams, willing to be respondents, willing to be examined, present when doing research. The sample in this study were class VII students of SMPN 01 V Koto Kampung Dalam Padang Pariaman Regency as many as 82 people consisting of 46 men and 36 women.

The tools used for data collection are WHO periodontal probe, mouth glass, tweezers, nierbeken, informed consent, puberty determinant format and gingival index examination format. The data analysis used was aimed at explaining the characteristics of each research variable in the form of averages with each research variable using a frequency distribution table.

3. RESULTS AND DISCUSSION

3.1 Research Results

3.1.1 Frequency distribution of the description of gingival status at puberty of seventh grade students of SMPN 01 V Koto Kampung Dalam Padang Pariaman Regency.

Table 1. *Frequency Distribution of Gingival Status during Puberty of Class VII Students at SMPN 01 V Koto Kampung Dalam Padang Pariaman Regency*

Gingival Status	f	%
Healthy	0	0
Mild Inflammation	37	45,1
Moderate Inflammation	41	50
Severe Inflammation	4	4,9
Total	82	100

Based on table 1, the majority of respondents experienced moderate inflammation, namely 50%.

3.1.2 Frequency distribution of the description of gingival status at puberty based on the gender of students in class VII SMPN 01 V Koto Kampung Dalam Padang Pariaman Regency.

Table 2. *Frequency Distribution of Gingival Status Based on Gender in Puberty Period of Class VII Students at SMPN 01 V Koto Kampung Dalam Padang Pariaman Regency*

Gender	Gingival Condition								
	Healthy		Mild Inflammation		Moderate Inflammation		Severe Inflammation	Total	
	f	%f	%	f	%	f	%	f	%
Male	0	023	50	22	48	1	2	46	100
Female	0	014	39	19	53	3	8	36	100
Total	0	037	45,1	41	50	4	4,9	82	100

Table 2 shows that many male respondents experienced mild inflammation at 50%, while many female respondents experienced severe inflammation at 53%.

3.2 Discussion

The results showed that none of the respondents had healthy gingiva conditions. This is because the respondents were selected in the condition of children who are experiencing endocrine hormonal changes that can cause vasodilation of blood vessels and hormonal imbalances in the body during puberty which make the gums easily susceptible to disease.

Based on the results of questions and answers to respondents, it was found that most respondents brushed their teeth only once a day using improper brushing techniques. In accordance with the theory which states that increased endocrine hormones accompanied by vascular changes cause the gingiva to become more sensitive, especially to toxins and other irritants such as plaque and calculus which result in inflammation of the gingiva (Putri, et al, 2018). Suboptimal maintenance of dental hygiene will cause bacterial development and result in gingival inflammation. Poor oral hygiene is the most common cause of gingival inflammation or gingivitis (D. Tilong, 2012). The results by Diah entitled "Differences in the Incidence of Gingivitis Between Prepubertal and Pubertal Ages in Malang City in 2018" with 33 respondents from SMP 22 Malang class VIII students who have experienced puberty and the results showed that none of the students had healthy gingival conditions (Diah et al, 2018).

Based on the results of the study, it was found that the criteria for severe inflammation were 4.9% of the 82 respondents, according to the researcher's assumption, this was due to a drastic increase in the production of estrogen and progesterone hormones. This increase causes increased blood flow to the gums, and also changes the reaction of gum tissue to bacteria and irritants in the plaque. This situation causes the gums to be morebright reddish in color, swollen, and bleed more easily when brushing teeth or chewing food that is too hard. Then severe inflammation occurs in 4 respondents this is due to not cleaning tartar that has accumulated on the surface of the teeth and has covered the gums, then poor nutritional intake and lack of vitamin C consumption, plus respondents have an irregular tooth position which makes food debris and plaque difficult to clean.

Based on the gingival examination, it was seen that the respondent had a lot of tartar and based on the results of the question and answer the male respondent had a smoking habit. Based on the theory of local factors causing gingivitis besides plaque, namely calculus. Calculus found on the surface of the teeth can cause gingival inflammation. This is because the rough surface of the calculus makes new plaque easy to stick to and if not cleaned over time there will be changes in the number and type of bacteria. Bacteria contained in plaque produce hydraulic enzymes resulting in widening of the intercellular space in the gingival epithelium. The degeneration that occurs in the gingival epithelium allows bacteria to enter the gums and infect the gums so that an antibody antigen reaction from the body occurs which causes inflammation of the gingival (Putri et al, 2018).

Factors in the occurrence of gingival inflammation are also caused by improper brushing time and technique, then poor nutritional intake, especially not consuming vitamin C and vitamin B, injury and trauma to the gums, hormonal changes that occur during puberty and irregular dental conditions that increase the risk of gingival inflammation or gingivitis (D. Tilong, 2012).

The results of the study based on the criteria for moderate inflammation found that there were 50% of the 82 respondents who experienced moderate inflammation, this was the criterion for gingival inflammation most experienced by respondents. According to the researcher's assumption, moderate inflammation occurs a lot in these respondents due to lack of attention to oral health, rarely checking oral health and oral health to dental and oral health services 1x6 months, then respondents who have never done dental flossing, then frequent snacks at school such as cariogenic foods and not rinsing their mouths after consuming these foods, then lack of information about oral health, as well as the influence of hormones during puberty where the level of stress experienced by pubertal adolescents causes a sense of laziness in maintaining oral health.

Hormonal changes that take place during puberty can cause changes in gingival tissue that responds to the development of plaque formation due to venting before entering adulthood which begins to make it unable to control emotions and carry out activities that are detrimental and have an impact on oral health or lack of self-care while experiencing puberty. Hormonal changes and instability that occur during puberty will cause gingival inflammation so that the increase in endocrine hormones during puberty causes the gingiva to become inflammatory and more sensitive.

Poor oral hygiene will cause bacteria to develop in the gingival neck, the more plaque buildup on the teeth, the higher the inflammation that occurs in the gingiva. Plaque on the gingiva has a very strong impact on the process of inflammation of the gingiva (Patriani, 2019) . Increased hormones during puberty can exacerbate gingival inflammation. Increased endocrine hormones accompanied by vascular changes can cause the gingiva to become more sensitive to toxins and other irritants such as plaque which results in gingival inflammation (Diah et al, 2018).

One of the factors that influence the occurrence of gingivitis in puberty is the factor of hormonal changes that occur, with changes or increases in hormones during puberty making the gingiva more sensitive to toxins so that it is prone to gingival inflammation (Beauchamp, 2009). Based on the theory of how to maintain oral hygiene, one of which is cleaning teeth with dental flossing so that plaque buildup does not occur so that oral health can be maintained properly (D. Tilong, 2012). The results of this study are in line with research conducted by Eldarita entitled "The Influence of Puberty on the State of Gingiva in Adolescents aged 10-20 years in Puhun Pintu Kabun District Mandiangin Koto Selayan Bukittinggi City in 2019" which shows that the highest gingival status is obtained with moderate inflammation, namely 39% (44 people) and the lowest is healthy criteria of 3.4%, namely 5 people (Eldarita, 2019) .

Previous research entitled "The Effect of Dental and Oral Hygiene Status (OHI-S) on Gingival Status (GI) in PSM Junior High School Students in Bukittinggi City in 2017" showed that most respondents had moderate inflammation criteria, namely 56.06% (Sukanti, Eka, 2017) . The results of another study with the title "Overview of Gingivitis in Pubertal Adolescents aged 10-15 years at SMP Negeri 10 Palembang in 2018" showed that most respondents had moderate inflammation criteria, namely 71.9% (Wicaksono, H.A, 2018).

The results showed that the most women experienced gingival inflammation, namely female respondents experiencing severe inflammation of 8% (3 people), this happened because the growth of women was 2 years earlier than men both in physical growth and in the growth of their teeth, where the eruption time of women's teeth is faster than men, so that girls' teeth are longer in the oral cavity. With the habits of respondents who lack awareness in maintaining oral hygiene, this can trigger the occurrence of diseases in the oral cavity, one of which is inflammation of the gums.

Based on questions and answers conducted to respondents, information was obtained that 3 respondents did not know how to brush their teeth properly and correctly, the respondents brushed their teeth only 1x a day in the morning while bathing, and they also never flossed using dental floss, and there was a lot of tartar that had accumulated and had never been cleaned to the oral health service. Furthermore, 3 of these respondents at the time of the study they were experiencing menstruation and during menstruation the female respondents had difficulty controlling their emotions which made them often stressed. To improve their mood, these female respondents consume sweet and sticky foods and they rarely brush their teeth before bed after consuming these foods.

Girls grow up 2 years earlier than boys. During this growth period there is an increase in hormones in girls which causes gingival inflammation to be more prone to occur in girls than boys. The eruption time of maxillary and mandibular permanent teeth varies in each individual. In general, the eruption time of girls' teeth is faster than boys so that the teeth in girls stay longer in the oral cavity (Primasari, A, 2018). Stress levels during puberty are also another factor that can trigger gingival inflammation, because when stressed cortisol hormone levels will increase and the immune system is impaired so that the gingiva is easily infected by bacteria. High levels of stress accompanied by a lack of maintaining oral health can exacerbate gingival inflammation (Diah et al, 2018).

Gingivitis is caused by plaque formation due to food debris that sticks to the surface of the teeth and mixes with bacteria in the oral cavity. If not cleaned, plaque will harden and form tartar. If tartar is not cleaned, germs will erode the gums and cause gingivitis (Rahayu, Culia and Robbihi, H.I, 2022). At puberty hormonal changes occur, during the menstrual cycle normally occurs every month which makes hormonal changes, especially an increase in progesterone. Hormonal changes that occur make the oral cavity experience changes including gums becoming swollen and bleeding easily. During puberty there are changes in sexual hormones that can cause changes in gingival tissue such as gingivitis will reach its peak (Kartasapoetra, 2010). The cause of gingivitis is due to the gingival inflammation process caused by local and systemic factors. Local factors cause inflammation due to plaque deposits (Nuraskin, 2021).

Research conducted by Dian Islamiyati entitled “The Effect of Dental and Oral Hygiene Status (OHI-S) on Gingival Status (GI) in PSM Junior High School Students in Bukittinggi City in 2016” which shows that of the 66 respondents who experienced the most gingival inflammation were male respondents, namely 54 people by 81.81% while female respondents were 12 people, namely 18.18% (Islamiyati, Dian, 2016). Another study conducted in Meulaboh on junior high school students obtained results from 63 respondents as many as 11 respondents (18%) had mild gingivitis, 24 respondents (38%) had moderate gingivitis and 28 respondents (44%) had severe gingivitis (Sartika & Suryani, 2024).

4. CONCLUSIONS

a. Of the 82 respondents in class VII of SMPN 01 V Koto Kampung Dalam Padang Pariaman Regency, the respondents experienced the highest gingival status, namely moderate inflammation as much as 50%.
b. Male respondents in class VII of SMPN 01 V Koto Kampung Dalam Padang Pariaman Regency have the most gingival status is mild inflammation by 50%, then has severe inflammation by 2%. Meanwhile, female respondents have the most gingival status is

moderate inflammation by 53%, and has severe inflammation by 8%.

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