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DESCRIPTION OF ODONTOGENIC INFECTIONS RELATED TO ORAL HYGIENE AT SDN 3 KALIBAWANG WONOSOBO INDONESIA

(GAMBARAN INFEKSI ODONTOGENIK TERKAIT KEBERSIHAN RONGGA MULUT DI SDN 3 KALIBAWANG WONOSOBO INDONESIA)

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ABSTRACT

Odontogenic infection is a disease of the oral cavity, the leading cause of caries and periodontal disease. Inadequate ability to brush teeth is one of the causes of this pathological condition. This study aims to determine the description of odontogenic infections at SDN 3 Kalibawang, Kalibawang District, Wonosobo Indonesia. The research procedure used a total sampling technique, and the research variable was students at SDN 3 Kalibawang Wonosobo who experienced odontogenic infections. The tools used in this research were an Android smartphone, the HI BOGI application, and Microsoft Excel. Results odontogenic infections at the school were 70.21% positive in 33 students. The severity of untreated caries by gender: boys are bigger at 61.7%, while girls are 36.3%. Kalibawang State Elementary School 3, Wonosobo Regency, tested positive for an odontogenic infection, one of the causes of which could be triggered by inadequate tooth brushing.

Keywords: odontogenic infections; PUFA/pufa index; tooth brushing

ABSTRAK

Infeksi odontogenik merupakan penyakit pada rongga mulut yang penyebab utamanya ialah karies dan penyakit periodontal. Kemampuan menyikat gigi yang kurang adekuat merupakan salah satu penyebab terjadi kondisi patologis tersebut. Penelitian ini bertujuan untuk mengetahui gambaran infeksi odontogenik di SDN 3 Kalibawang, Kecamatan Kalibawang Wonosobo. Prosedur penelitian menggunakan teknik total sampling, variabel penelitian adalah murid SDN 3 Kalibawang Wonosobo yang mengalami Infeksi odontogenik. Alat yang digunakan dalam penelitian ini adalah smartphone android, aplikasi HI BOGI dan Microsoft Excel. Hasil infeksi odontogenik di sekolah tersebut sebesar 70,21% positif pada 33 siswa/i. Keparahan karies yang tidak dirawat berdasarkan jenis kelamin anak laki-laki lebih besar 61,7%, sedangkan anak perempuan 36,3%. Sekolah Dasar Negeri 3 Kalibawang, Kabupaten Wonosobo positif memiliki infeksi odontogenik yang salah satu penyebabnya dapat dipicu dari cara menyikat gigi yang belum adekuat.

***Kata kunci**: indeks PUFA/pufa; infeksi odontogenik; menyikat gigi*

INTRODUCTION

Dental and oral health in Indonesian society is still a severe problem today. Based on Riskesdas data, the prevalence of people experiencing dental and oral health problems in Indonesia in 2018 was 57.6%, which has increased compared to before. That year, the number of residents receiving dental health services was only 10.2%. The dental and oral disease that many Indonesians suffer from is dental caries, with a prevalence of 92.2% at the age of 35 - 44 years.[1,2] It was 43.4%, with 54% of children aged 5-9 years and 41.4% of children aged 10-14 years experiencing caries.[3]Elementary school children are an age that is vulnerable to dental caries because they have the habit of eating sweet foods and drinks.[4]

Odontogenic infection is a disease that occurs in the oral cavity, the leading causes of which are teeth with caries and periodontal disease. This infection is commonly found in children and adults. 5

The triggers for odontogenic infections come from aerobic and facultative anaerobic bacteria. If left untreated, this infection generally spreads to adjacent fascial spaces such as masseter, sublingual, submandibular, temporal, buccal, canine, and parapharyngeal and can cause additional complications.[5]

One region in Indonesia, namely Wonosobo Regency, has a proportion of dental and oral health problems of 56.7%.[6] Wonosobo Regency is administratively part of Central Java province, with 15 sub-districts, 236 villages, 29 sub-districts, and 24 health centers. One of the sub-districts in Wonosobo is the Kalibawang sub-district, which is the newest sub-district and was inaugurated in 2003. Based on data on dental and oral health services for Wonosobo district in 2018, the Kalibawang Community Health Center does not yet have dental and oral health services, including health promotion to SD/MI Kalibawang.[6]Judging from the number of health facilities and the availability of health workers in the Kalibawang sub-district, this could be a factor in the high number of dental and oral health problems in the sub-district. Based on the health profile of Wonosobo Regency in 2020, around 58 elementary school children need dental and oral care. However, only 1 child had the opportunity to receive treatment because there were still very few dentists in Kalibawang District.

School-aged children are a critical age group because, at that age, a child is vulnerable to quite complex and varied health problems. For students at the elementary school (Sekolah Dasar Negeri or SDN) level, the health problems that arise are usually related to personal and environmental cleanliness. A more prominent issue is clean and healthy living behavior, such as how to brush your teeth properly, washing your hands with soap, and other personal hygiene. The behavior of brushing teeth in children must be carried out in everyday life without feeling forced. Brushing your teeth correctly and adequately is vital for oral health care. Tools also influence the success of brushing your teeth, the method of brushing your teeth, and the correct frequency and timing of brushing your teeth. Poor oral health in children can last into adulthood and worsen if they do not receive immediate treatment from a dentist. Treatment handled at primary school will provide better results than treatment initiated in adulthood because primary school age is transitioning from the milk teeth phase to the permanent teeth phase.[7,8]

Based on the description above, the researcher intends to research to determine the description of odontogenic

infections related to oral hygiene at SDN 3 Kalibawang Wonosobo.

METHOD

This type of research is descriptive research with a cross-sectional approach. This research was conducted on students at State Elementary School 3 Kalibawang at State Elementary School 3 Kalibawang Wonosobo to determine the description of odontogenic infections. The subjects in the research were students at SDN 3 Kalibawang Wonosobo.

The inclusion criteria in this research were students willing to be research subjects and students who attended school. The exclusion criteria in this study were students at SD Negeri 3 Kalibawang who were absent, students who experienced an illness that made it impossible to follow a series of research procedures, students who experienced problems opening their mouths, taking photos of the oral cavity did not comply with the proper procedures. This research technique uses a total sampling technique. The variables in the study were students at SDN 3 Kalibawang Wonosobo who experienced odontogenic infections. The tools used in this research were an Android smartphone and the HI BOGI application. Data obtained from screening results on SDN 3 Kalibawang students, input into the HI BOGI application, are processed using Microsoft Excel. The research location was SDN 3 Kalibawang, Wonosobo, and the research time was November 10, 2022.

The PUFA index (Pulpal Involvement, Ulcer, fistula, and abscess) is used to clinically assess the condition of untreated caries in both permanent and primary teeth. This index was introduced by Monse et al. in 2010. It was created separately from the DMFT/dmft index and the pulp involvement score and ulceration of the oral mucosa due to root fragments, fistula, or abscess. Lesions that were not caused by untreated caries were not scored. Uppercase letters are used for permanent teeth (PUFA), and lowercase letters are used for milk teeth (pufa). Assessment can be done visually without using instruments. Grading only gives one score per tooth.[9–11] The PUFA/pufa score per person is calculated in the same cumulative manner as DMF/dmft and represents the number of teeth that meet the diagnostic criteria for pufa. The results of PUFA assessments for permanent and PUFA for primary teeth must be reported separately. Doubtful cases of odontogenic infection were assigned a baseline value (P/p for pulp involvement). The score for PUFA in permanent teeth ranges from 0-32. In contrast, the PUFA index in primary teeth ranges from 0-20.[10,11]PUFA/pufa prevalence was calculated as the percentage of the population with one or more PUFA/pufa

scores. The PUFA/pufa experience for the population is calculated as an average, which may be a decimal value.

RESULT

The research was conducted on students at State Elementary School 3 Kalibawang, Wonosobo, with a sample of 47 students consisting of 18 female and 29 male students. Data was collected using the HI BOGI application to assess the PUFA Index by directly examining the oral cavity.

Table 1. Distribution of severity of untreated caries by gender

Characteristics	Frequency (n)	%	P/p	U/u	F/f	A A	PUFA/pufa index
Gender							
Man	29	61.7	64	1	0	0	2,2
Woman	18	38.3	20	0	0	0	1.1
Average			**42**	**0.5**	**0**	**0**	**1.7**

Based on Table 1, it was found that the total number of pufa in Kalibawang State Elementary School 3 students was 85 cases, the largest being pulpation of the teeth. In the group of boys, 64 teeth had the severity of untreated dental caries in the form of exposed pulp (p); ulcer (u) of 1 tooth; and there is no caries that is not treated and causes fistulas (f) or abscesses (a). In the group of girls, 20 teeth had the severity of untreated dental caries in the form of exposed pulp (p), and there are no ulcers (u) or untreated caries that cause fistulas (f) or abscesses (a). Examination data showed that 85 teeth had caries with pulp involvement and ulceration, but no fistulas or abscesses were found, with an average pufa obtained of 1.7.

Table 2. Percentage of odontogenic infections of Kalibawang State Elementary School 3 students

Odontogenic Infection Examination Results	Amount	% (Percentage)
Positive	33	70.21%
Negative	14	29.79%

Based on Table 2, the results

showed that 33 Kalibawang State Elementary School 3 students experienced odontogenic infections (70.21%), and 14 students (29.79%) did not experience odontogenic infections.

DISCUSSION

Odontogenic infection is a disease that occurs in the oral cavity, the leading causes of which are teeth with caries and periodontal disease. Bacteria found in plaque in the gingival cavities and oral mucosa can cause odontogenic infections. These bacteria are normal flora in the oral cavity. These bacteria include gram-positive anaerobic cocci, aerobic cocci, and gram-negative anaerobic rods. These bacteria can cause caries, gingivitis, and periodontitis if not treated. They continuously result in odontogenic infections caused by the entry of these bacteria into the pulp, necrosis causing periodontal pockets.[5.12] Kaneko et al. divide odontogenic infections into 4 classifications based on the location of the infection. The first group is pulpitis infection, which is included in apical and marginal periodontitis and can cause other diseases such as alveolar abscesses, palatal abscesses, and gingival abscesses. Second, the condition is associated with impacted third molars, but abscess formation is rare in this group. The third is a condition where osteitis and osteomyelitis occur, which are the development of periodontitis (group 1) and pericoronitis (group 2). Osteomyelitis that often occurs in the mandible can be acute, chronic, or even sclerotic. The fourth group is an inflammatory process that spreads from groups 1-3. This fourth classification includes space infections such as sublingual, submandibular, submental, pterygomandibular, lateral pharyngeal, and pharyngeal spaces infections.[12]

The body enhances the immunological response by activating nuclear polymorphism (PMN) at the site of infection and activating T cells and B cells, which produce antibodies that can provide resistance to antigens. Bacterial products will induce the epithelium to release inflammatory mediators such as IL-1, IL-8, PGE2, TNF-α, and matrix metalloproteinase (MMP). Interleukin 1 plays a role in stimulating osteoclast activity, which causes bone resorption. Interleukin 8 will stimulate connective tissue and bone resorption. Tumor necrosis factor Alfa (TNF-α) plays a role in influencing local vascular responses, extracellular matrix degradation, and bone resorption. Increased destruction of gingival extracellular matrix and stimulation of bone resorption is activated by Prostaglandin E2 (PGE2). MMP plays a vital role in normal tissue remodelling and

growth. The response of inflammatory mediators is what indicates the initial process of inflammation. The extent of spread depends on the level of bacterial virulence, host resistance, and the anatomical position of the infection. Infection begins in an acute phase characterized by edema and severe pain, which can be accompanied by fever and malaise. Next is the chronic phase, characterized by discomfort in various pain levels and mild reactions in the surrounding tissue.[12,13]

This infection is commonly found in children and adults.[5]One region in Indonesia. Namely, Wonosobo Regency has this problem. The proportion of dental and oral health problems in Wonosobo Regency is 56.7%.[6] Judging from the number of health facilities and the availability of health workers in the Kalibawang sub-district, this could be a factor in the high number of dental and oral health problems in the sub-district. This problem was related to the inspection at Kalibawang 3 Elementary School, Wonosobo Regency, in 2022. It was explained that the percentage of odontogenic infections at the school was 70.21% positive in 33 students. The results of linear research explain the condition of dental and oral health problems from Riskesdas 2018. Odontogenic infections can be triggered due to the imperfect ability to brush teeth. It is related to HL Blum's (1974) explanation, which states that knowledge or sources of information and a person's attitudes will shape behaviour.[14] The elementary school group is an age that is vulnerable to complex health problems with varying aspects. Hygiene issues for individuals and groups are the main focus of health issues in elementary school groups. This hygiene includes the scope of clean and healthy living behaviour (PHBS), oral hygiene related to how to brush your teeth, and other personal hygiene. The behaviour of brushing teeth in children must be carried out in everyday life without feeling forced. Brushing your teeth correctly and adequately is essential for oral health care. Tools also influence the success of brushing your teeth, the method of brushing your teeth, and the correct frequency and timing of brushing your teeth. By knowing these factors, it is hoped that we can reduce odontogenic infections that occur in elementary school groups.

Based on the research results, it can be seen that the severity of untreated caries by gender in the number of students at State Elementary School 3 Kalibawang, Wonosobo Regency, is 61.7% more for boys, while 36.3% for girls. According to Barsevičienė et al. (2018), gender is a determining factor in the ability to brush

teeth. Teenage girls can brush their teeth by paying attention to time.[14] The severity of caries in elementary school students can be related to suboptimal tooth brushing skills. According to Robbins (2000), the ability to brush teeth with the correct movements can be supported by technical modelling.[15] Manual toothbrushes still dominate the majority of toothbrushing habits in Indonesia. The primary purpose of brushing teeth is to remove plaque and break down its formations, clean teeth from food, debris, and stains, stimulate tooth tissue, and help apply the specific composition of toothpaste to surfaces with caries, periodontal disease or sensitive teeth.[16,17]The method of brushing teeth that are considered adequate at elementary school age around 6-7 years is the horizontal technique, namely by brushing movements on the surface of the teeth horizontally, going forward and backwards. It has the advantage of being an easy and effective way to eliminate dental plaque. However, the drawback is that this method is impractical in cleaning teeth in the proximal part and gingival sulcus.[16,18–20] According to Bergenholtz et al. The Bass method has advantages in removing supragingival plaque on the lingual surface compared to the Roll, Circular, and Horizontal methods. Another study showed that after 6 months, there was a significant reduction in the gingival index in the Horizontal method and modified Bass method groups.[19]

Apart from the tooth brushing technique, the duration of the brushing also needs to be considered. The importance of this duration determines the effectiveness of tooth brushing in removing plaque. Plaque reduction with a manual toothbrush is generally 30-45 seconds per quadrant, so generally, the recommended tooth brushing time for one oral cavity is 120 seconds (USA) and 180 seconds (Europe).[17,18]This depends on several factors, namely plaque accumulation in the oral cavity, psychomotor abilities, adequate cleaning of food, bacteria and debris by saliva. With the suggestion of pulling the brush on one area for around 5-10 pulls.[16]

CONCLUSION

Odontogenic infections mainly occur due to caries and periodontal disease. Inadequate ability to brush teeth is one of the causes of this pathological condition. According to the description of State Elementary School 3 Kalibawang, Wonosobo Regency, which tested positive for odontogenic infections was 70.21%. However, this cannot be used as a complete picture of the Wonosobo Regency area because the scope of the research was only in the elementary school age range.

CONFLICT OF INTEREST

The author states that the scientific article has no conflict of interest.

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