

Description of the Caries Pattern of Stunted Toddlers in Panduman Village, Jelbuk District, Jember Regency, East Java



Dyah Setyorini¹, Berlian Prihatiningrum², Sulistiyani³, Niken Probosari⁴, Roedy Budirahardjo⁵, Sukanto⁶

^{1,2,3,4,5,6}Pediatric Dentistry, Faculty of Dentistry, Jember University, Kalimantan Street No 37 Jember East Java Indonesia

ABSTRACT: Introduction: Stunting is a disruption of growth in toddlers, namely the height of toddlers is lower than the standard of age which is based on the body's long index compared to the age (PB / U) or height compared to the age (TB / U) with a z-score of less than -2 SD. Stunting can increase the risk of caries in the deciduous teeth because it cause atrophy in saliva and it also impairs the normal function of the salivary gland. The purpose of this study was to analyze the pattern of stunting children caries in Panduman Village, Jember, East Java.

Methods: This study used an descriptive observasional with cross sectional approach. Samples were chosen using purposive sampling, amounted to 45 children.

Result: The most commonly found caries were on occlusal surface of mandibular primary molar tooth with a profunda caries depth. It was found that 23 samples had caries on the occlusal surface of mandibular molar teeth with 11 samples having profunda caries depth.

Conclusion: The pattern of stunting children is most commonly found in mandibular primary molar on the occlusal surfaces with profunda caries depth.

KEYWORDS: Caries Pattern, Stunting, Toddlers, Body Long Index, Panduman Village

I. INTRODUCTION

Stunting is a condition of impaired growth in toddlers, namely the toddler's height is lower or shorter (dwarf) than the standard age.¹ Stunting in toddlers is based on the index of body length for age (PB/A) or height for age (TB/A) with a z-score less than -2SD/standard deviation (stunted) and less than -3SD (severely stunted).²

Stunting in toddlers is caused by multidimensional factors in the form of direct and indirect factors.³ Stunting begins in the process of growth and development which begins when the fetus is in the womb until the age of 2 years, so it is called the 1000 HPK period. The first 1000 days of life (HPK), which starts from the time the fetus is in the womb until the child is 2 years old, is the most critical period for improving children's physical and cognitive development.⁴

Indonesia is one of the countries that has a fairly high stunting problem, namely 36.4%, from this data Indonesia is included in the third country with the highest prevalence in the Southeast Asia region.¹ The results of the Nutrition Status Monitoring (NSM) survey in 2016 stated that in East Java high stunting exceeded 40% in Sampang district, and seven other areas were in the range of 30% - 39.2%, namely in Jember Regency (39.2%), Sumenep (32.5%), Bangkalan (32.1%), Bondowoso (34.6%), Pamekasan (32.2%), Lumajang (30.6%), and Bojonegoro (30.1%).⁵ Jember Regency is a district in East Java Province with a high prevalence of stunting. The first number of cases of stunting under five in 2017 occurred in the working area of the Jelbuk Health Center with a percentage of 39.30%.⁶

Nutritional deficiencies in stunting toddlers have an impact on increasing the prevalence of dental and oral diseases.⁷ The oral cavity of stunted toddlers, manifestations occur in the form of disruption of the development of the salivary glands, resulting in atrophy of the salivary glands.⁸ Manifestations of nutritional deficiencies in the oral cavity can result in various kinds of dental and oral diseases, one of which is caries. Caries in primary teeth spreads more quickly, is extensive, and is more severe than permanent teeth.⁹ Damage to primary teeth shows a certain pattern. The pattern of caries is the order of the number of caries on each surface and the type of primary teeth and the order of caries depth.¹⁰

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II. METHODS

This type of descriptive observational research with cross-sectional data collection techniques. The research was conducted on stunting toddlers in Panduman village, Jelbuk sub-district, Jember district, East Java who were willing to be examined as research subjects. Parents/guardians signed an informed consent form before the clinical examination was carried out and if they were not willing, they were not included in the study. The examination was carried out by 2 students of the Faculty of Dentistry, Jember University, referring to the literature studies that had been carried out by researchers.

The study population was children aged 24-60 months and were stunted toddlers in Panduman village, Jelbuk sub-district, Jember district, East Java. The sampling technique used was purposive sampling, so that a total of 45 children as research subjects met the inclusion and exclusion criteria.

Examination was carried out using examination tools in the form of a mouth mirror and sonde and using the aid of light and a camera for documentation. The data obtained included: name, age, sex, type of tooth affected by caries (incisor, canine, and molar) depth, surface of caries (mesial, distal, occlusal, buccal, labial), caries depth (superficial, media, deep) was recorded in the examination formula/odontogram, then processed using the Excel Office program and described through a frequency distribution table. Health research ethics recommendations were given by the Health Research Ethics Committee of the Faculty of Dentistry, University of Jember.

III. RESULTS

The total number of stunted toddlers examined was 45, consisting of 23 girls and 22 boys with an age range of 24-60 months. Examination results in the maxillary region showed that the type of primary tooth and the surface most frequently affected by caries was the mesial surface of the central incisor. These results are shown in (Table 1). The most common caries depth found in central incisors was media caries in 9 study samples, followed by deep caries in 7 study samples, and superficial depth in 5 study samples (Table 2).

Table 1. Frequency Distribution of Caries based on the number of surfaces involved in the maxillary teeth.

	Mesial	Distal	Labial/Buccal	Palatal	Incical/Occlusal
51	19	5	8	0	5
52	7	4	5	1	5
53	3	3	8	4	3
54	2	1	1	3	11
55	0	0	2	1	9
61	19	9	6	1	5
62	7	4	3	1	2
63	6	5	3	2	2
64	4	1	0	2	10
65	1	2	0	1	13
Total	74	34	36	16	65

Table 2. Frequency distribution of caries based on caries depth in maxillary teeth

	Superficial	Media	Profunda
51	5	9	7
52	4	3	6
53	5	5	4
54	3	3	7
55	1	3	5
61	8	9	5
62	5	2	3
63	6	3	2
64	3	4	6
65	3	5	6
Total	43	46	51

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Examination results in the mandibular region showed that the type of primary tooth and the surface most frequently affected by caries was the occlusal surface of the molar teeth. These results are shown in (Table 3), the most common caries depth found in molars was deep caries in 11 study samples, followed by media depth in 8 study samples, and superficial depth in 7 study samples (Table 4).

Table 3. Frequency Distribution of caries based on the number of surfaces involved in the mandibular teeth.

	Mesial	Distal	Labial/Buccal	Palatal	Incisal/Occlusal
71	2	2	1	0	1
72	3	1	2	0	0
73	3	1	4	0	1
74	4	6	2	2	11
75	3	3	4	3	21
81	3	2	1	0	2
82	2	0	0	0	0
83	1	0	3	0	0
84	3	1	0	1	16
85	4	3	2	4	23
Total	28	19	19	10	75

Table 4. Frequency distribution of caries based on caries depth in mandibular teeth.

	Superfisial	Media	Profunda
71	2	1	1
72	3	2	0
73	3	2	1
74	5	6	7
75	3	9	10
81	2	3	1
82	2	0	0
83	2	1	1
84	2	6	9
85	7	8	11
Total	31	38	41

IV. DISCUSSION

The condition of stunting caused by chronic malnutrition affects oral and dental health, such as causing disturbances in the development of the salivary glands which can increase the risk of dental caries.¹² Primary tooth caries in toddlers shows a certain pattern. The pattern of caries consists of the type of primary tooth affected, the tooth surface affected by caries and the severity of caries.¹³

Mandibular molars are much more susceptible to caries when compared to other teeth. The results of Triana's study in 2020 study showed that molar teeth are teeth that are prone to caries with a percentage of 66-88% when compared to all teeth in children.¹⁴ These conditions are related to the depth of the pits and fissures of the teeth and the extent of contact with the adjacent teeth and the space between the mandibular primary molars.¹⁵ Surfaces of primary teeth are susceptible to caries in order, namely occlusal surfaces, proximal contacts (mesial and distal), labial, incisal and lingual surfaces. The increase in caries in the occlusal area is caused by the morphology of the occlusal surface which makes bacterial plaque difficult to clean mechanically.¹⁶ According to research studies that have been conducted, the occlusal surface is eight times more susceptible to caries compared to other tooth surfaces, this is because the occlusal surface has pits and fissures. The risk of caries in pits and fissures is quite high, amounting to 83% of all carious lesions.¹⁷ The severity of caries as seen from the depth of caries is superficial caries, media caries and deep caries. The pattern of caries depth in primary teeth is reversed compared to permanent teeth. Primary teeth are more commonly found to have deep caries, followed by media, and superficial.¹⁸

The results of the study in table 1 show the highest caries of the maxillary central incisor or tooth order 51 and tooth 61 on the mesial surface respectively regarding 19 research subjects. Central incisors are susceptible to caries because the maxillary

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central incisors are the first teeth to erupt in the maxilla so that the teeth will experience caries attacks first.¹⁹ Maxillary central incisors are prone to caries, especially in the proximal contact (mesial and distal). According to a study conducted by Lucas, et al, 2019, caries on the proximal contact has a prevalence of 88.2% compared to caries on other surfaces, this is because the proximal area of the teeth is more prone to caries due to frequent food impaction and difficult to remove the plaque accumulation.²⁰

The results of the study in table 2 show that the highest caries depth was in the maxillary central incisor region, namely media caries regarding 9 research subjects. This condition is influenced by the morphology of the primary incisor teeth, namely the thickness of the enamel is half the thickness of the enamel on permanent teeth, has a higher pulp horn and a pulp chamber that is wide enough to make it easier for the pulp to open due to caries.²¹

The results of the study in table 3 show the highest caries regarding the mandibular primary molars or teeth of order 85. The morphology and anatomy of the mandibular primary molars influence because there are deep gaps or grooves on the occlusal surface of the mandibular primary molars which are often difficult to clean so that they can become location of caries development.²²

The condition of stunting in toddlers can also be a factor causing caries, which is due to developmental disorders in the salivary glands. Stunted children are more susceptible to caries as a result of decreased salivary function, so that the caries experience of stunted children is found to be higher when compared to normal children.²³ Shrinking in the size of the salivary glands has an impact on reducing the protective properties of saliva, where saliva plays an important role in cleaning non-adherent bacteria and debris in the oral cavity, reduces self-cleansing in the oral cavity, can reduce the immunological components that play a role as an antimicrobial to neutralize viruses, bacteria, and toxins from enzymes and increases the risk of caries due to an imbalance between the demineralization and remineralization processes due to disruption of these salivary functions.²⁴

V. CONCLUSION

The description of the caries pattern of primary teeth in stunted toddlers in Panduman village, Jelbuk District, Jember Regency, East Java, aged 24-60 months, shows a distinctive pattern. The prevalence of caries was found as many as 23 out of 45 toddlers experiencing caries in the mandibular primary molars, tooth 85 with the most frequently affected surface, namely the occlusal surface with deep caries depth.

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