

DESCRIPTION OF EARLY CHILDHOOD CARIES WITH CHRONOLOGICAL AGE OF DENTAL IN PRESCHOOL CHILDREN AT RSGM UNJANI
(GAMBARAN EARLY CHILDHOOD CARIES DENGAN USIA KRONOLOGIS GIGI PADA ANAK USIA PRA SEKOLAH DI RSGM UNJANI)

Rhabiah El Fithriyah^{1*}, Henri Hartman¹, Farhan Yudistira¹

¹Department of Pediatric Dental Health Dentistry, Faculty of Dentistry, Universitas Jenderal Achmad Yani, Cimahi, Indonesia

*Corresponding author
devirhabiah@gmail.com

JHDS.unjani.ac.id/jite
Doi: 10.54052/jhds.

Article History
Received: 23/10/2022
Accepted: 18/11/2022

ABSTRACT

Early Childhood Caries (ECC) is a chronic disease in children that is most common under 71 months and is a multifactorial disease that can be seen directly (Intra Oral) or by radiographs. This study aims to determine the picture of ECC at preschool age assessed through radiographs. This research method is a descriptive observational study with a cross-sectional approach. The number of research subjects was 39 from the radiological data of the RSGM UNJANI. Sampling was in accordance with the inclusion and exclusion criteria, consisting of radiographs aged 3-5 years. The study was conducted by assessing the level of tooth decay in children using radiographs. Data processing using SPSS with the univariate analysis aims to describe the chronological Age and Early Childhood Caries using frequency distribution and percentage. The results of this study indicate that children aged 3-5 years are susceptible to early caries. This study concludes that ECC occurs mainly in preschool children with severe categories.

Keywords: early childhood caries; preschool age

ABSTRAK

Early Childhood Caries (ECC) merupakan suatu penyakit kronis pada anak yang paling umum dibawah usia 71 bulan dan merupakan penyakit multifaktorial yang dapat dilihat secara langsung (Intra Oral) maupun dengan radiograf. Penelitian ini bertujuan untuk mengetahui gambaran ECC pada usia prasekolah yang dapat dinilai melalui gambaran radiograf. Metode penelitian ini merupakan penelitian deskriptif observasional dengan pendekatan potong lintang (cross sectional). Subjek penelitian berjumlah 39 dari data radiologi RSGM UNJANI. Pengambilan sampel sesuai dengan kriteria inklusi dan eksklusi yang terdiri dari gambaran radiograf yang berusia 3-5 tahun. Penelitian dilakukan dengan cara menilai tingkat kerusakan gigi anak dengan gambaran radiograf. Pengolahan data menggunakan SPSS dengan analisis yang akan digunakan adalah univariat yang bertujuan untuk menggambarkan usia kronologis dan Early Childhood Caries dengan menggunakan distribusi frekuensi dan persentase. Hasil penelitian ini menunjukkan bahwa anak usia 3-5 tahun rentan terkena karies dini. Simpulan dari penelitian ini adalah ECC paling banyak terjadi pada anak usia prasekolah dengan kategori severe.

Kata kunci: early childhood caries; usia prasekolah

INTRODUCTION

Early Childhood Caries (ECC) is early childhood caries characterized by the presence of one or more decayed teeth (cavity or non-cavity) and loss of teeth due to caries or fillings on the surface of primary teeth in children aged 71 months or younger. The American Academy of Pediatric Dentistry (AAPD) describes

Severe Early Childhood Caries (SECC) as characterized by the presence of caries on a smooth surface in children under three years of age to 3-5 years of age or a defs more than four at three years of age, more than five at Age 4 years, or more than six at Age 5 years.^{1,2}

Radiographs can assess dental caries. A radiograph is a tool used to assist

in the initial step of detecting disease. Panoramic radiographs are one of the radiographs that are often used in dentistry to produce images of primary teeth and permanent teeth that will erupt in one film so that they can see root resorption of primary teeth in the stages of tooth growth and development with minimum radiation exposure so that they can determine dental age.³⁻⁵

High dental caries in children can lead to poor dental and oral health status. Dental caries can cause pain in the teeth, mouth, and jaw. If there is caries in the primary teeth that isn't treated, it will result in early extraction of the primary teeth, which will result in loss of the contact area of the teeth; the space becomes small and shifts to the location of the extracted tooth, so the teeth will not grow in a normal position. This condition will result in crowding.⁶⁻⁸

HC Clark, MEJ Curzon 2004, investigated prospective clinical examination and radiographic findings for diagnosing dental caries in children. The study results indicate that radiographic photographs can be used as optimal information for diagnosing caries with a broader perspective for assessment. Based on this background, the authors are interested in researching the level of ECC damage with the chronological age of the

teeth in preschool-age children at RSGM Unjani.

METHOD

Study Design

This study used an observational descriptive cross-sectional study that measured the damage variable of early childhood caries with the chronological age of the teeth in preschool-aged children at RSGM Unjani simultaneously. Each research subject was observed only once, and the risk factors and impacts were measured according to the circumstances or status at the observation time.

Subjects

The subjects of this study were panoramic radiographs of preschool-age children who were registered as patients at RSGM Unjani. The inclusion criteria in this study were panoramic radiographs of preschool-age children at RSGM Unjani. The radiographs were not blurry, had good detail, density, distortion, and contrast, and the image was not cut. All parts of the teeth studied were visible through panoramic radiographs and ECC at stages 2 and 3. Exclusion criteria in this study were panoramic radiographs in pediatric patients who did not have caries, stage 1 ECC, and radiographs without age information.

Number of Samples and Sampling Techniques

The sample size in the study followed the research objectives, namely the descriptive category with the number of samples that met the inclusion and exclusion criteria. The formula for the sample size for categorical descriptive research is as follows:

$$n \geq \frac{(Z_{\alpha/2})^2 p \cdot q}{e^2}$$

Which is:

n: number/sample size

Z: the standard value of normal distribution at 95% confidence level ($Z_{\alpha} = 1.96$)

α : level of accuracy

p: estimated proportion determined statistically, namely = 0.25

q: 1-p

e: error rate

The total sample used in this study was 39. The univariate analysis described chronological Age and Early Childhood Caries using frequency and percentage distributions.

Aspects of Research Ethics

Data were obtained from medical records and panoramic radiographs on a sample of preschool-age boys and girls at RSGM Unjani. In its implementation, this research has received ethical approval from the ethics committee of Padjadjaran University, Bandung, with number 1148/UNG.KEP/EC/2020.

RESULT

The study was conducted in the Radiology Department of Unjani Dental and Oral Hospital from December 2020 to January 2021. There were 39 samples used in this study. This study aims to determine the difference in chronological age with the ECC description of children's teeth to help determine the diagnosis and treatment plan in dental health services; the results of the study are as follows.

Description of Research Subject Characteristics

Based on Table 1 describes the description of the characteristics of research subjects based on age and gender. The overall average patient age was 7.11 ± 1.128 months consisting of 17 male patients, or 43.6%, and 22 female patients, or 56.4%.

Table 1. Description of the Characteristics of Research Subjects

Variable	n=39	%
Age		
Mean±Std	7.11±1.128	
Median	7.00	
Range (min-max)	5.00-10.00	
Gender		
Male	17	43.6
Female	22	56.4

Chronological Age Description

Table 2 describes the chronological age description. The average patient's chronological age was 64.13 ± 7.480

months.

Table 2. Chronological Age

Variable	n =39
Chronological age (months)	
Mean±Std	64.13±7.480
Median	67.00
Range (min-max)	40.00-71.00

Chronological age was obtained from secondary data in the form of medical records of panoramic radiographic images, which included data in the form of the patient's medical record number, full name, date of birth, date of taking the radiographic photo, and the scale of the image. Chronological age was defined as a person's age determined from birth. In medical records, the patient's chronological age was obtained from the difference between the date of taking the radiographic photo and the date of the patient's birth. A total of 17 panoramic radiographs of male patients were given code A, and 22 panoramic radiographs of female patients were given code B, collected, and met the inclusion and exclusion criteria.

Classification

The stages of early childhood caries consist of three stages, in terms of age and damage to the ECC.

Type I (mild to moderate) white spots involving incisors or molars. The most common cause is a combination of solid foods and poor oral hygiene. A white

line can be seen in the cervical area on the vestibular and palatal surfaces of the maxillary incisors. At this stage there are no symptoms, generally not recognized by parents or at the first clinical examination of the child's oral cavity. This lesion can only be recognized when the entire tooth is drained and is painless.^{2,10,11}

Type II (moderate to severe) is a picture of a lesion in the labiolingual that affects the maxillary incisors with or without caries on the molars, depending on the child's age and stage of the disease. If the white lesions on the incisors develop, the dentin is damaged, which will cause damaged enamel. White lesions on the anterior maxillary teeth extend to the dentin with a soft texture and visible discoloration of the teeth. The affected teeth are generally upper anterior on the labial, lingual, and occasionally proximal surfaces. Generally, the mandibular incisors are not affected. At this stage, the child will complain because of a feeling of pain when touched by cold food or drink. Parents usually have noticed changes in the color of their child's teeth.^{2,10,11}

Type III (severe) could describe by carious lesions affecting almost all teeth, including the mandibular incisors. It was usually caused by food that is cariogenic and poor oral hygiene.^{2,10,11} Clinical pictures of the classification were listed in

Figures 1, 2, and 3.

Table 3. Classification

Variable	n =39	%
Researcher 1		
Mild to moderate	18	46.2
Severe	21	53.8
Researcher 2		
Mild to moderate	23	59.0
Severe	16	41.0
Researcher 3		
Mild to moderate	17	43.6
Severe	22	56.4
Average		
Mild to Severe	19	48.7
Severe	20	51.3

Table 3 describes an overview of the classification. For the Classification of P1, the mild to the moderate category is 18 or 46.2%, and the Severe is 21 or 53.8%. For Classification P2, the mild to the moderate category is 23 or 59.0%, and the severe category is 16 or 41.0%. For Classification P3, the mild to moderate category is 17 or 43.6%, and the Severe is 22 or 56.4%. For classification, the average category for mild to moderate is 19 or 48.7%, and Severe is 20 or 51.3%.

DISCUSSION

In this study, it was found that there were more girls with ECC than boys. The

results of this study follow Alkhtib's research. A in 2016 conducted on preschoolers in the suburbs of Ife City, Nigeria, and Qatar stated that girls suffer from ECC more than boys.⁹

Distribution of ECC sufferers based on age group, which is most common in children aged 64-69 months and in line with the growth of children's age, the more susceptible to suffering from ECC. These results are consistent with a study in Sudan that examined preschool children aged 3-5 years, which stated that children aged five years most often suffer from ECC, and the highest prevalence of ECC is in children aged 3-5 years.⁹ Similar results were found in a study conducted in Surakarta City in 2017 which showed that children aged 3-5 years experienced more ECC than children who did not have ECC.⁹

Based on table 3, it was found that many children suffered from SECC (51.3%) compared to Mild to Severe (48.7%). This study showed that almost all samples aged ≤ 71 months at RSGM Unjani had the highest caries rate at 67 months of age. This age is the indexed age for primary teeth because the process of dental caries in this age group is faster. It showed that this age group is vulnerable to early caries because, generally, they still have behaviors or habits that are not supportive of dental and oral

health, for example, gargling with plain water after drinking milk and eating chocolate. In addition, preschoolers aged 3-6 need their parents' assistance, especially mothers, in terms of maintaining oral hygiene when brushing their teeth. The mother's role in helping children brush their teeth is very much needed considering that preschool children aged 3-6 years still need guidance from their parents.¹²

Epidemiological studies describe low socioeconomic status, minority status, low birth weight, and microbial transfer from the mother as risk factors for ECC; 1-12% of children under six in developed countries experience ECC. In developing countries and within disadvantaged populations of developed countries, the prevalence of ECC is as high as 70%. Poor dental and oral health impacted children's quality of life and health. Untreated caries can cause pain and difficulty in chewing food, thus affecting the child's weight, speech, and concentration, which will then interfere with the learning process.¹³

Although the epidemiology of ECC shows varied and high numbers, ECC is a preventable disease. Early detection of ECC which will reduce pain in the teeth, and help improve the growth and development of children. Prevention of ECC can be done in the pre- and perinatal period. But, the level of awareness among pregnant women in

preventing dental and oral diseases is still lacking, so it is important to pay attention to dental and oral care for pregnant women and women of childbearing age which is beneficial in terms of personal health and helps prevent the initial transmission or transmission of dental caries that they experience.^{14,15}

In this examination process, the radiographs obtained were adjusted according to the inclusion and exclusion criteria; the sample included the ECC criteria if there was a radiolucent image of the primary tooth in the crown that had reached the dentin as in region five teeth 52 and if there was a radiolucent image on the crown that had reached the dentin dental pulp, loss of all crowns or remaining roots in primary teeth as in region five teeth 53. Determining type II or type III ECC could be from the severity of the entire region; it can be said to be type II ECC if, on the radiographic appearance, there are no lesions or cavities in the teeth mandibular incisors and can be said to be type III ECC if, on the radiographic appearance, almost all the teeth have lesions or cavities including the mandibular incisors. An example of an image is listed in Figure 4.



Figure 1. Early Childhood Caries (ECC) Mild to Moderate.²



Figure 2. Early Childhood Caries (ECC) is Moderate to Severe.²



Figure 3. Early Childhood Caries (ECC) Severe.²



Figure 4. ECC Panoramic Photo.

CONCLUSION

This study concludes that ECC in the severe most commonly occurs in preschool-aged children, and ECC is a

severe public health problem and often occurs at the age of 3-5 years.

CONFLICT OF INTEREST

With this, the author declares no conflict of interest in the scientific articles written.

ACKNOWLEDGEMENT

We want to thank the professionals who have assisted in the research process and the preparation of papers, including the Unpad ethics committee and the medical record section of RSGM Unjani.

REFERENCES

1. Angelica C, Sembiring LS, Suwindere W. Pengaruh tingkat pendidikan tinggi dan perilaku ibu terhadap indeks def-t pada anak usia 4 – 5 tahun. *Padjajaran J Dent Res Student*. 2019;3(1):20–5.
2. J. Early Childhood Caries dan Kualitas Hidup Anak. *Zenit*. 2016;4(2):121–8.
3. Zsa Z, Nissa S, Soenawan H, Wahono NA. The Difference on Permanent Teeth Development Stage among Physiological and Pathological Root Resorption of Primary Teeth, A Panoramic Study of Girls Aged 6-8 Years. 2013;(4).

4. Alfian AA, Gigi FK, Hasanuddin U. Radiografi Panoramik pada Metode Coronal Pulp Cavity Index (CPCI) Radiografi Panoramik. 2016.
5. Nurul Iffah Auliyah. Estimasi Usia berdasarkan Gambaran Gigi Radiografi Panoramik pada Metode Harris Dan Nortje. 2016.
6. Nurwati B, Setijanto D, Budi HS, Banjarmasin PK, Ilmu D, Gigi K, et al. Hubungan Karies Gigi Dengan Kualitas Hidup pada Anak Sekolah. 2019;10(1):41–7.
7. Alazmah A. Early childhood caries: A review. Vol. 18, Journal of Contemporary Dental Practice. 2017. p. 732–7.
8. Suarniti L. Pencabutan Dini Gigi Sulung Akibat Caries Gigi Dapat Menyebabkan Gigi Crowding. Jurnal Kesehatan Gigi. 2014;2(2):233–8.
9. Syahrudin Muhh. Gambaran Early Childhood Caries (ECC) Pada Anak Prasekolah Berdasarkan Faktor Risiko Biopsikosial. 2018;121.
10. Isra M. Perbandingan Karakteristik Saliva pada Anak di Bawah 2 Tahun Antara Severe Early Childhood Caries (SECC) dan Bebas Karies di Kecamatan Medan Selayang. 2017.
11. Utara US. Perbedaan Jumlah Streptococcus mutans dalam Saliva pada Anak SECC dengan Bebas Karies pada Anak Usia 2 Tahun kebawah di Kecamatan Medan Sunggal. 2018.
12. Mintjelungan CN. Prevalensi Karies Gigi Sulung Anak Prasekolah di Kecamatan Malalayang Kota Manado. Jurnal Biomedik (Jbm). 2014;6(2).
13. P TE, Saptarini R, Kedokteran D, Anak G, Gigi FK, Padjadjaran U. Childhood Caries. 2018;1(1):37–41.
14. Jeffrey. Early Childhood Caries dan Kualitas Hidup Anak. Zenit. 2016; 4 (2): 121-8.
15. Barat S, Sumatera W. Cakradonya Dent J; 10(1): 27-30. 2013;10(1):27–30.

