
From the Department of Child Health 1) and Dental Clinic 2) of the Provincial Referral Hospital, Medical School, University of North Sumatra, Medan

Caries in Outpatients at the Department of Child Health and Dental Clinic of the Provincial Referral Hospital (RSUPP) in Medan during 1971 — 1973

by

SAHAT HALIM 1), HELENA SIREGAR 1), SRINITA TANYATI 2) and SANTI ULI SIMANJUNTAK 2).

Abstract

Of 3,000 children with dental caries examined at the Department of Child Health and Dental Clinic of the Provincial Referral Hospital in Medan during 1971 — 1973, the highest caries percentage is found in the age group of 3 — 9 years (74.4%); it is also noted that caries is already prevalent in the group of 1 — 3 years (6.2%). Caries can be prevented by giving fluoride topically or orally and by oral hygiene. To prevent further dental decay, conservation or extraction has to be done.

Received 11th. Sept. 1974.

Introduction

Dental caries is found in almost every person all over the world, in children and adults. Anyhow, there are some groups or nations that appear to be immune against caries, i.e. the Eskimo's, Maori's in New Zealand, and people of several African countries. It is also apparent that these groups still have a primitive way of life, but after they become familiar with modern living, research shows that their teeth too are affected by caries. According to Hogeboom (1960), caries is a disease of the hardest part of the teeth caused by environmental changes which produce lactic acid that rapidly destroys enamel, followed by the destruction of the organic compound by proteolytic enzymes. Due to the high percentage of caries, a survey was done on outpatients at the Department of Child Health and Dental Clinic of the Provincial Referral Hospital (RSUPP), Medan, to assess the prevalence and severity of dental decay.

Material and methods

This survey was done at the Department of Child Health and Dental Clinic of the Provincial Referral Hospital, Medan, between 1971 — 1973.

1. Outpatients at the Department of Child Health.

The teeth of 18,720 children were examined; Children with decays were immediately sent to the Dental Clinic for further and more detailed examination and, if necessary,

prompt treatment was given. The result was that 1,053 children had tooth decay/anomalies.

2. Dental Clinic.

Of all the attendance, 1974 children were found to have dental decay/anomalies.

All of them were registered and treated.

Examination and recording — All patients were examined and registered by the dentist. The lesions were chronic caries, irritative pulpae, hyperaemia pulpae, pulpitis, gangrenous pulpae, radices, abscess, and persistency. Examination was done with:

- mouth mirror
- probe
- pincer
- dentotest
- thermo-test

Results

Of 18,720 child patients attending the Department of Child Health, 1,053 children (5.41%) had caries. It was noted that in the age-group of 1 - 3 years (6.2%) caries was already prevalent (Table 1). The percentage of dental caries was nearly the same in the age group of 3 - 6 and 6 - 9 years, 35.7% and 39% respectively. Thus dental caries occurred more frequently in the age group of 3-9 years (74.4%) (Table 1).

TABLE 1: Age distribution in 3,000 children with caries

Age (years)	Number	%
1 — 3	186	6.2
3 — 9	2,246	74.7
3 — 6	1,077	35.7
6 — 9	1,169	39.0
9 — 13	568	18.7

Table 2 shows that chronic caries was most frequently seen in the age group of 3-9 years (1,662 children). Sequence of dental decay after chronic caries is gangrenous pulpae, persistency, radices, abscess, pulpitis, hyperaemia pulpae, and irritation pulpae with a ratio of 54.3: 27.9: 21.1: 18.3 9.2: 2.2: 1.2: 1, respectively. From the 7 types of dental decay, chronic caries and gangrenous pulpae are 54 and 28 times much more frequent than irritation pulpae.

TABLE 2: Different types of dental decay according to number and age group

Types of dental decay	No. of patients	No. of teeth	1 — 3 yrs.		3 — 6 yrs.		6 — 9 yrs.		9 — 13 yrs.	
			pat	teeth	pat	teeth	pat	teeth	pat	teeth
A b s c e s s	682	1,098	46	86	323	554	224	349	89	109
Chronic caries	2,020	6,526	162	618	979	3,291	683	2,129	196	488
Gangrenous pulpae	1,542	3,350	73	210	701	1,665	584	1,184	184	291
Hyperaemia pulpae	139	235	7	9	59	95	44	83	29	48
Irritation pulpae	55	116	8	14	18	40	19	38	10	24
Persistency	1,226	2,543	3	5	268	474	726	1,336	269	728
P u l p i t i s	213	258	10	16	77	93	57	66	69	83
R a d i c e s	895	2,189	45	135	376	1,109	410	848	64	97

From Table 2 it is apparent that a child can have more than one type of dental decay; most of them (27.5%) had one type of dental decay, 8.6% with 4 types, and 1.1% with more than 4 types (Table 3).

TABLE 3: Number of different types of decay encountered

No. of different types of decayed teeth	Children	
	Number	%
1	825	27.5
4	258	8.6
> 4	32	1.1

Discussion

* Classification of dental caries.

A-According to the mode of expanding:

1. Penetrating caries — Caries than expands from enamel to dentin in a conical form.
2. Undermining caries — Caries that expands sideways from enamel to dentin, thus forming an undermined edge.

B-According to the depth of caries:

1. Caries superficialis — Only the enamel is affected, while the dentin is not.
2. Caries media — Dentin is already affected, but it has not yet reached half of the dentin.
3. Caries profunda — More than half of the dentin is affected and sometimes the pulpa too.

C-Clinical classification:

1. Acute caries — Caries that causes heavy damage to the teeth within a short time.

2. Chronic caries — Dental decay proceeds slowly, while the patient does not feel any pain, though it nearly reaches the top of the pulpa. This is because a secondary dentin has been formed at the top of the pulpa.
3. Senile caries — Caries at cement-enamel junction in old people, with regression of the gingiva.

* Etiology.

The factors which play a role in caries formation can be divided into 2 groups:

1. Causal factors — directly influencing the teeth.
2. Conditional factors — indirectly causing caries.

I. Causal factors

Chemo-parasitic Theory of Miller: Plaque that contains many bacteria and food remainders, carbohydrate and others, undergoes decomposition by microorganism:

- a) Lacto Bacillus Acidophylus (acid forming bacteria) produces lactic acid,

strong enough to dissolve anorganic part of the enamel comprising 96 — 98% of anorganic compound.

- b) Streptococcus group, which enters through the damaged enamel and produces proteolytic ferment that destroys organic parts of enamel and dentin.

II. Conditional factors of Miller

- a) Age: The relation of caries with age is still not clear. It is assumed that during childhood, changing period of the teeth, puberty, the teeth cannot so well withstand the outside destructive influences.
- b) Food: Calcium, phosphorus, ferum, magnesium, and vitamin (A,C.-D) have an important role in the formation of caries. If there is deficiency of the above substances in prenatal and post-natal period, the teeth will become weak and more sensitive to outside influences.

— Vitamin A: has influence on the dentin and enamel formation.

— Vitamin C: has influence on the dentin formation.

— Vitamin D: has influence on absorbing calcium and phosphorus for enamel formation.

- c) Localization, shape and structure of the teeth: When the above stated malformation are present, food is easily lodged and difficult to be cleaned, so that caries may easily develop.

Every carious tooth may become:

- chronic caries
- acute caries.

Normally, the caries does not extend to a more severe condition because of the formation of secondary dentin at the bottom of the cavity. But in chronic caries, where the crown eventually breaks, the pulpa exposed, then gangrenous pulpae, or radices ensue, and if this state continues, periodontitis, abscess, and osteomyelitis can occur. Chronic caries that can be restored is treated by conservation; but if it is not possible (e.g. caries affects the whole surface of the teeth), it is then left alone.

Chronic caries can exist when the resistance of the pulpa is high and accompanied by a solid structure of the teeth. If the resistance is low, acute caries will appear, which begins from superficial caries, and later becomes irritation pulpae. If it is neglected it can rapidly become hyperaemia pulpae, pulpitis, gangrenous pulpae, periodontitis, abscess, and then osteomyelitis with its complications. From the explanations above we can draw a conclusion that preventive efforts must be taken before caries appears. If caries is present it is advisable to make a conservation therapy instantly to prevent more disasterous damages. If necessary, extraction treatment is recommended when conservation treatment is not possible.

In this survey (Table 1) it was noted that caries occurred more frequently in the age group of 3 - 9 years ($\pm 74.4\%$);