

Dental caries in Coloured and Indian children aged 1 — 5 years.

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SUMMARY

Dental caries was studied in 226 Coloured and 328 Indian children using mirror and sharp probe. Dental caries was common and increased with age. There was significantly more caries in Coloured children at 1 year than in Indian children, but thereafter, no significant differences were found. Low numbers of children had labial and rampant caries during the first 2 years of life, but thereafter, the prevalence increased.

OPSOMMING

Tandkaries is by 226 Kleurling- en 328 Indiërkinders ondersoek met gebruik van 'n mondspeël en sonde. Tandkaries was algemeen en het toegeneem met ouderdom. Dit het aansienlik meer dikwels onder Kleurlingkinders as onder Indiërkinders op die ouderdom van 1 jaar voorgekom maar daarna is die verskille nie betekenisvol nie. Labiale en algemene karies het by klein getalle kinders in hul eerste twee jare voorgekom maar daarna het dit toegeneem.

The purpose of this investigation was to determine the dental caries prevalences of urban Coloured and Indian preschool children living in the environs of Johannesburg, South Africa, an area with a low fluoride concentration in the drinking water. The findings will serve as baselines for future studies on caries prevalences in South African communities.

MATERIALS AND METHODS

The sample of children studied were from Coloured (children of mixed European, African and Malayan parentage) and Indian communities. These were from the Nancefield and Lenasia areas some 20-30 km South of Johannesburg. They consisted of 226 Coloured children, 129 females and 97 males, and 328 Indians, 186 females and 142 males. Drinking water for both groups was from the same piped supply (Rand Water Board) which has a mean yearly concentration of fluoride of 0,2 mg/litre.

The subjects were drawn from two sources within the communities. Within each group approximately half of the children were examined at 2 nursery schools (all the children in each being examined), while the other half were studied at the 2 well child clinics serving the communities, at which routine immunizations are given and growth and development are monitored. At the clinics days were selected at random and all the children attending on those days were studied. No children were examined at both nursery school and clinic. This technique ensured samples representative of the 2 communities.

Teeth were examined in good natural light with mirror and sharp probe. Dental caries was diagnosed when the probe "caught" in suspicious areas, pits or fissures. At each examination session, randomly selected children were examined twice to check for intra-examiner variation. A total of 42 such double examinations were carried out and the modified percentage reproducibility for agreement in diagnosis of healthy and carious teeth calculated according to the method of Shaw and Murray (1975) was 94 percent. The mean dmft for the repeated cases was 4,7 at the first examination and 4,8 at the second. The difference in dmft was not statistically significant when the median test was applied.

Labial caries was defined, for this study, as caries on the labial surface of one or more incisor or canine teeth; rampant caries as a dmft score of 5 or more teeth (Cleaton-Jones *et al*, 1978a).

The dental observations were recorded and transferred to punch cards for analysis in an IBM 370/158 computer using the Statistical Package for the Social Sciences (Nie *et al*, 1975). Statistical tests employed were the chi-square test and the median test, while the level of statistical significance chosen was $p < 0,01$.

RESULTS

No significant differences were found between the observations for males and females, so pooled data will be presented.

Table 1. Dental caries observations in Coloured and Indian children of 1-5 years.

Group	Age	n	Mean values \pm s.d.					Labial n (%)	Rampant Caries
			Caries-free children n (%)	Teeth at risk	dmft	dmft/100 at risk	dmft \geq 5 n (%)		
Coloured	1	33	26 (78,8)	11,5 \pm 4,3	0,5 \pm 1,3	3,8 \pm 9,5	0 (0)	1 (3,0)	
		69	68 (98,6)	9,7 \pm 4,9	0,0 \pm 0,2	0,2 \pm 1,5	1 (1,4)	0 (0)	
Coloured Indian	2	39	25 (64,1)	19,2 \pm 1,6	1,3 \pm 2,4	6,5 \pm 11,8	2 (5,1)	2 (5,1)	
		57	41 (71,9)	18,0 \pm 3,0	1,3 \pm 3,1	6,9 \pm 15,6	2 (3,5)	4 (7,0)	
Coloured Indian	3	48	23 (47,9)	19,9 \pm 0,5	2,2 \pm 3,5	11,1 \pm 17,5	2 (4,2)	6 (12,5)	
		54	27 (50,0)	19,8 \pm 0,7	2,9 \pm 4,0	14,6 \pm 19,9	8 (14,8)	14 (25,9)	
Coloured Indian	4	55	14 (25,5)	20,0 \pm 0,0	4,8 \pm 4,5	24,1 \pm 22,6	8 (14,5)	21 (38,2)	
		71	19 (26,8)	20,0 \pm 0,0	4,1 \pm 4,5	20,7 \pm 22,8	7 (9,9)	23 (32,4)	
Coloured Indian	5	51	10 (19,6)	20,0 \pm 0,0	5,2 \pm 4,3	26,2 \pm 21,7	6 (11,8)	27 (52,9)	
		77	13 (16,9)	20,0 \pm 0,0	6,6 \pm 5,1	33,0 \pm 25,5	15 (19,5)	43 (55,8)	
Coloured	TOTAL	226	98 (43,4)	18,6 \pm 3,4	3,1 \pm 4,0	15,8 \pm 20,2	18 (8,0)	57 (25,2)	
Indian		328	168 (51,2)	17,5 \pm 4,8	3,2 \pm 4,5	16,0 \pm 22,6	33 (10,1)	84 (25,6)	

Details of the dental caries observations of all the subjects are listed in Table 1. There was a gradual increase in dental caries with age indicated by diminishing numbers of caries-free children. In the 1 year old (12-23 months), only one Indian child had dental caries which consisted of 2 labial cavities. Dental caries was more common among the Coloured children at this age, the difference between Coloured and Indian children being statistically highly significant ($\chi^2 = 9,48$, $p < 0,005$). Among older children the numbers with caries were similar. The greatest increase in numbers of subjects with caries occurred between 3 and 4 years for the Coloured children and between 1 and 2 years among Indian children. The mean numbers of teeth at risk were similar in both groups.

Caries severity, indicated by mean dmft scores, was significantly greater at 1 year among Coloured compared with Indian children ($\chi^2 = 9,48$, $p < 0,005$). At 2 years the scores were identical and at 3 and 5 years, dmft scores were greater among Indian children. The differences were not statistically significant. The greatest increase in mean dmft was between 3 and 4 years in Coloured children and between 4 and 5 years in Indian children. The mean dmft/100 teeth at risk showed similar patterns.

Labial caries was uncommon in the 1 year old group — it was not seen in any Coloured children and only in one Indian child. The prevalence remained low until 3 years among Indian children and 4 years among Coloured children. The differences in the prevalences between Coloured and Indian groups were not statistically significant.

Rampant caries was common from 4 years onward and by 5 years, over half the children in each group had a dmft of at least 5. No significant differences were found between the Coloured and Indian children.

In Table II similar data are presented, but the caries-

free children have been excluded. This is to enable examination of the caries severity among children with the disease. Other than in the 1 year group, dmft scores were higher among Indian children, compared with Coloured children, although the differences were not statistically significant. Increases in dmft remained greatest between 3 and 4 years in Coloured children, but the pattern changed for the Indian children. In this group, the greatest increase was from 1-2 years. The changes in dmft/100 teeth at risk paralleled those for the dmft scores. The percentage prevalences for labial and rampant caries increased due to the now smaller sample size. The 100 per cent prevalence of labial caries at 1 year is misleading, since the only Indian child with caries at that age had the disease in the form of labial caries.

Details of d, m and f values of children with caries are shown in Table III. The low m and f values in relation to high d scores show the low level of curative dental treatment received by the children.

DISCUSSION

The dental caries prevalence and the caries severity indicated by dmft scores in the 2 groups of children examined were as had been expected from previous clinical impressions. The lack of curative dental treatment was also as had been anticipated, and is due to a combination of lack of motivation and a lack of dental services for the age groups examined.

There were several unexpected observations. We had expected to find greater numbers of children with labial caries during the first two years, i.e. up to 35 months of age, and that more Coloured children would show rampant caries. In earlier studies in Black and in White groups (Cleaton-Jones *et al* 1978a; Cleaton-Jones, Richardson & Rantsho, 1978b), the period of greatest increase in dental caries was between 3 and 4 years. In the present study, this was observed in the Coloured children. Indian children showed the greatest increase between

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Table II. Dental caries severity in Coloured and Indian children with caries. Caries free subjects have been excluded.

Group	Age	n	Mean values \pm s.d.				
			Teeth at risk	dmft	dmft/100 at risk	Labial Caries n (%)	Rampant Caries dmft \geq 5 n (%)
Coloured	1	7	13,7 \pm 2,1	2,4 \pm 2,0	17,9 \pm 13,7	0 (0)	1 (14,3)
Indian	1	1	16,0 \pm 0,0	2,0 \pm 0,0	12,5 \pm 0,0	1 (100,0)	0 (0)
Coloured	2	14	19,7 \pm 1,1	3,6 \pm 2,7	18,0 \pm 13,5	2 (14,3)	2 (14,3)
Indian		16	19,5 \pm 1,4	4,7 \pm 4,3	24,0 \pm 21,3	2 (12,5)	4 (25,0)
Coloured	3	25	19,8 \pm 0,8	4,3 \pm 3,9	21,5 \pm 19,3	2 (8,0)	6 (24,0)
Indian		27	20,0 \pm 0,0	5,6 \pm 3,8	29,0 \pm 19,0	8 (29,6)	14 (51,9)
Coloured	4	41	20,0 \pm 0,0	6,5 \pm 4,1	32,3 \pm 20,4	8 (19,5)	21 (51,2)
Indian		52	20,0 \pm 0,0	5,7 \pm 4,4	28,3 \pm 22,2	7 (13,5)	23 (44,2)
Coloured	5	41	20,0 \pm 0,0	6,5 \pm 3,9	32,6 \pm 19,4	6 (14,6)	27 (65,8)
Indian		64	2,0 \pm 0,0	7,9 \pm 4,5	39,7 \pm 22,7	15 (23,4)	43 (67,2)
Coloured	TOTAL	128	19,6 \pm 1,6	5,5 \pm 3,9	27,9 \pm 19,6	18 (14,1)	57 (44,5)
Indian		160	19,9 \pm 0,5	6,5 \pm 4,5	32,5 \pm 22,4	33 (20,6)	84 (52,5)

Table III. Details of d, m, f in children with caries (Mean values \pm s.d.). Caries free subjects have been excluded.

Age	n	Coloured			Indian			
		d	m	f	n	d	m	f
1	7	2,4 \pm 2,0	0	0	1	2,0 \pm 0,0	0	0
2	14	3,6 \pm 2,7	0	0	16	4,6 \pm 4,1	0,1 \pm 0,5	0
3	25	3,9 \pm 3,9	0,4 \pm 1,0	0	27	5,1 \pm 3,2	0,4 \pm 1,3	0,3 \pm 1,3
4	41	5,1 \pm 3,2	1,0 \pm 2,3	0,04 \pm 0,2	52	4,3 \pm 3,5	1,2 \pm 2,4	0,1 \pm 0,5
5	41	4,7 \pm 2,6	1,5 \pm 2,6	0,3 \pm 1,6	64	5,7 \pm 3,3	2,1 \pm 3,1	0,1 \pm 0,8
TOTAL	128	4,5 \pm 3,1	0,9 \pm 2,1	0,1 \pm 1,0	160	5,0 \pm 3,4	1,3 \pm 2,5	0,1 \pm 0,8

4 and 5 years for the total group and from 1 to 2 years in those children with caries, a pattern which cannot be explained at present.

Examination of the dental literature reveals a lack of studies of similar groups, both in South Africa and elsewhere. Van Wyk, Konvisser and Dreyer (1976) investigated the dental caries prevalence among Cape Malays (a group of Coloureds belonging to the Moslem faith) and found dmft values at 4 and 5 years to be 5,6 and 7,9 respectively. These are similar to those observed in our Coloured Johannesburg sample. Two studies in South African Indian communities have investigated dental caries in a small number of young children. Staz (1943) found 68,5 per cent of 6-12 year old Indians from Johannesburg to have caries, while van Wyk, Staz and Farman (1977) reported the dmft score of Indian children aged 3-6 years to be 7,7. Both these figures are similar to those observed in the present Indian group.

Comparison of the findings in the present study to those in South African Black (Cleaton-Jones, Richardson & Rantsho, 1978b) and White children (Cleaton-Jones *et al*, 1978a), revealed that during the first 2 years, the numbers of children caries-free and those with rampant caries, as well as dmft scores were low and similar to the Black groups. Thereafter, the observations in the present study were similar to those in White children.

The prevalences of labial caries was surprisingly low during the first 2 years of life, a period during which the lesion might be expected in view of its alleged link with bottle feeding. This observation is being further studied.

CONCLUSION

1. Dental caries was common in both Coloured and Indian children, but the prevalence was significantly higher in Indian children of 1 year of age.
2. Experience of curative dental services in both groups is low and usually consists of extractions.
3. The prevalence of labial caries within the first two years of life, when the lesion might be expected, was low.

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