Caries prevalence of the primary dentition at age seven: an indicator for future caries prevalence in the permanent dentition

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Abstract

The correlation between caries prevalence in the primary dentition at age 7 and the permanent dentition at age 13 was examined in 136 children. The caries increment in the permanent dentition from age 7 to 13 years was also examined. A correlation coefficient of 0.47 in 79 males and 0.61 in 57 females (p<0.001) was found between the deft at age 7 and the DMFS at age 13. A significant difference in caries prevalence and increment in the permanent dentition was found between the children originally having a zero to five deft and those with a deft of six or above.

Introduction

Several studies[1-5] have examined the correlation between caries prevalence in the primary and permanent dentition at different ages. Adler[1] indicated a weak correlation between the caries prevalence of the primary dentition and the permanent dentition, but many of the children were initially in the late mixed dentition age. Hill, et al.,[5] examined the correlation between caries prevalence in the primary dentition at age six with the caries prevalence in the permanent dentition at ages up to fourteen. The majority of the population which Hill examined received fluoridated water from birth or early childhood.

The purpose of this study was to: 1) determine if the caries prevalence in the permanent dentition of children aged 13, living in a non-fluoridated area was related to the caries prevalence in the primary dentition at age seven; and 2) determine if the caries experience, as measured by the number of primary teeth decayed, indicated for extraction, and filled (deft) at age seven could be an indicator of future treatment needs.

Methods and Materials

Two hundred and thirty-six children constituting the total second grade population of three schools in a mixed socio-economic suburb of Jerusalem were examined for caries at age seven. One hundred and thirty-six of these children (79 males and 57 females) were examined again at age thirteen: the remaining 100 children were not available for the second examination. There was no significant difference (p>0.05) of the deft at age seven between the 100 children not available (6.67 ± 3.55) and the 136 children seen at the second examination (6.30 ± 3.50).

The examinations at age seven and thirteen were carried out in a school dental clinic using WHO's criteria[6] for recording caries. Only the deft was recorded at age seven, whereas the caries experience in the permanent dentition was expressed as DMFT (decayed, missing, and filled teeth) and DMFS (decayed, missing, and filled surfaces) at both examinations. The examinations of each group were done by the same examiner and radiographs were not taken.

The large majority (96%) of the thirteen-year-old children had received dental care during the intervening years, the F-value being 49.2% of the DMFT at age 13. The correlation between the deft at age 7 and the DMFS at age 13 was compared using the Rank correlation coefficient. The correlation was examined in males and females separately and in the total group. The children were also divided into two groups according to the deft at age seven as indicated in Tables 1 and 2. The DMFT and DMFS at age 13, and the caries increment in permanent teeth from age 7 to 13 were compared in these two groups.

Results

At age 7, the deft of the 136 children was 6.3: the DMFS at age 13 was 11.87. The DMFT at this age was 6.92, composed of D = 3.47, M = 0.04 and F = 3.41. The correlation between deft at age 7 and DMFS at age 13 (Table 3) was significant at the level $p \leq 0.001$. The correlation appears to be higher in females (0.61) than in males (0.47).

The comparison of the caries prevalence at age 13 according to the two deft levels at age seven is shown in Table 1. Highly significant differences ($p \leq 0.001$) were found in the DMFT and DMFS between those children originally having 0 to 5 deft, and those with 6 to 15 deft. A comparison of the caries increment in permanent teeth from age 7 to age 13 in the two groups (Table 2) showed the same significant differences.

Discussion

The findings in this study agreed with those reported previously,[1,2,5] showing a positive correlation between the caries prevalence in the primary and permanent dentition. In this investigation, the correlation appeared to be higher in females. The r values found were such that the forecast for future caries prevalence in the permanent dentition, based on the caries prevalence in the primary dentition, can be used for population groups but not for individuals.

When the children were divided into groups according to level of caries prevalence in the primary dentition as shown in Table 1 and 2, significant differences were found in the caries prevalence and increment in

Table 1. Caries prevalence at age 13 by deft at age 7.

No. of children	Deft at age 7	DMFT at age 13	DMFS at age 13
48	0-5	4.27 ± 2.19*	7.02 ± 4.12*
88	6-15	8.24 ± 3.77*	14.51 ± 7.16*

* p<0.001

Table 2. Caries increment in the permanent dentition from age 7 to age 13, by deft at age 7.

| No. of children | deft at age 7 | Caries increment from age 7 to 13 | |
		Teeth	Surfaces
48	0-5	2.65 ± 1.67*	4.77 ± 3.18*
88	6-15	4.95 ± 3.51*	9.19 ± 6.74*

* p<0.001

Table 3. Correlation between deft at age 7 and DMFS at age 13.

	No.	Correlation Coefficient	Level of Significance
Males	79	0.47	p<0.001
Females	57	0.61	p<0.001
Total Population	136	0.53	p<0.001

the permanent dentition. This strengthens the conclusion that caries experience in the primary dentition at age seven can be used as an indicator for future caries in population groups. Therefore preventive measures should be implemented as soon as possible.

The caries prevalence of the population examined (DMFT of 6.92 at age 13 years) is higher than that reported in previous work on the incidence of caries in Israel.[7,8] These findings may indicate a trend of caries increase among Israelis, but differences in examination methods could account for this increase.

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