

## INFLUENCE OF DENTAL DECAY DURING THE GROWTH IN DIFFERENT AREAS IN CUENCA, SPAIN

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*Abstract: In this study, belonging to the wide study of growth done in Cuenca, we deal with the influence of dental decay in the present population, as a possible sanitary sign and an indicative point in the quality of life. The research includes 1800 people both sexes of a rural area (three specific areas: Alcarria, Sierra and Mancha). They were divided in six groups of different ages between 13 and 17 years old. The research also includes a sample of young people: males and females. The present study shows the influence of the socioeconomic, cultural and geographic situation in dental health.*

*Key words: Human dentition; Caries; Diet; Rural populations.*

### Introduction

Dental decay appeared very early in the history of humanity: injuries in human teeth realized by dental decay which date back to the Paleolithic and Neolithic have been observed (Bennike 1985). It has been referred to it as the illness of "civilization", because caries appeared when human populations adopted a "soft and sweet" nutrition of occidental type (Newbrun 1978, Triller 1981, Smith and Garn 1987, Tanguay, Buschang and Demirjian 1986, Maat and Van der Velde 1987, Hildebolt et al. 1989).

In comparison with caries occurrences in recent time, it is true, however, that caries has been relatively rare in the early history of mankind and has first become really widespread in connection with the spread of civilization (Wells 1975).

Dental caries may attack the enamel crown (especially on the occlusal surface and the proximal and distal sides), the dentine, the transition to the cement and finally the root itself.

It involves a desmineralization and solution of hydroxyl apatite in the enamel and dentine and a proteolysis of the organic component of the dentine. Hydroxyl apatite is soluble at a pH of 4-5, i.e. in an acid medium, and the rate of solution depends on how low the pH of the plaque falls. This process is governed by several factors, not least the number of bacteria and their acid production, but the number of bacteria depends on the thickness of the plaque, which is again related to the different kinds of sugars contained in the food. Saccharose in particular is held to be the most cariesfacient sugar, while sugar alcohols (sorbitol or xylitol) do not cause appreciable fermentation (Hillson 1980).

Although the dental decay is never mortal and seldom incapacitates people, it represents a considerable socioeconomical cost due to its great frequency.

It's known that the factors which cause dental caries can be grouped in three great categories: factors related to the teeth carbohydrates of the food (sugars) and factor related to the bacteria. Sugar consumption has been quintupled in Western Europe since 1850, in parallel with the growth of the dental decay measure. The sugar-caries correlation has been clearly demonstrated.

Saccharose particularly favours the colonization of the teeth surface by the bacteria. And they are more harmful when they remain in buccal cavity for long (due to non-buccal hygiene) or, more frequently, when they are swallowed (number of meal with starch).

### Material and Methods

We have analysed a sample constituted by 1800 members of both sexes and ages between 13 to 17 years old, both included, and a young group of adults (18 to 25 years old), in the three natural regions of the Cuenca province: Alcarria, Sierra and Mancha.

The presence/absence of dental decay has been studied in each member, for each one of the definitive dental pieces.

The data were collected through direct observation, the present permanent dental pieces being and notated in individual cards as well as the absent pieces. In the case it was distinguished between non-emerged and extracted pieces, the absence by extraction being considered present, as well as decay pieces (Demirjian 1983). The appearance of the third molar wasn't taken into account owed to its belated eruption with regard to the ages of the study (Sánchez 1987, Mesa 1986). We have studied the habits and the foods consumed throughout the development; the percentage of grease, proteins, carbohydrates and other nutriments; dietetic inquiries were carried out and traced for 7 days which informed us of the qualitative feeding.

We have realized  $\chi^2$  (Chi-Quadrat) tests to see if the differences between the percentages of dental decay incidence were significant for all dental pieces in the three regions and for both sexes. The results are enclosed in tables.

Our objective: this paper tries to emphasize the importance of the buccal hygiene and the feeding diet as a way of dental decay prevention as well as its relation to the socioeconomical level of the member valued by the studies level and parent's profession.

### Results

The pieces which show a bigger percentage of caries in the three regions and for both sexes are the first and second molar (M1 and M2). That is in part because of their position into the mouth as well as their function to triturate. These are the more directly implicated pieces in mastication; and as they are situated in the rear part of the mouth, access to cleaning is made difficult, so helping accumulation of food rests and this promotes the appearance of bacterial coverings which cause the dental decay. Occlusal caries were almost exclusively found on molars.

*First molar:* This is the piece with the highest percentage of caries because it's the dental piece which is exposed longer to the risk of suffering caries.

The incidence of the caries shows a very high percentage in the three regions for the first molar (14-45%), and it has been observed that the Sierra and Alcarria show a dental decay incidence similar in both sexes for this dental piece, while the Mancha has lower values. The differences are very significant between Sierra-Mancha and Alcarria-Mancha in men (Table 1). In women the significant differences are observed between the Sierra and Mancha (Table 1). We haven't observed significant differences between both sexes in the caries incidence.

Table 1. Dental decay percent in Sierra (S), Alcarria (A), and Mancha (M) men and women (means and SDs)

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MEN

Maxillary - left

M2			M1			PM2			PM1			C			I2			I1		
S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M
15.33	9.33	3.00	35.00	34.66	13.33	5.00	6.33	3.66	8.00	7.33	6.00	1.66	1.33	1.00	2.33	0.00	1.33	2.33	0.00	0.00
4.10	4.98	3.60	5.00	13.35	6.59	3.78	5.58	4.38	5.77	5.37	4.61	2.42	2.21	2.23	2.42	0.00	1.88	3.72	0.00	0.00

Maxillary - right

M2			M1			PM2			PM1			C			I2			I1		
S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M
13.33	12.66	4.66	28.66	28.33	14.00	5.00	6.00	3.33	6.66	10.00	8.66	3.00	1.33	1.00	3.00	0.00	3.00	2.33	0.00	0.00
5.37	5.73	3.77	6.99	11.68	4.89	3.00	6.73	3.77	3.19	6.00	6.18	2.23	2.21	2.23	2.23	0.00	3.60	3.72	0.00	0.00

Mandibular - left

M2			M1			PM2			PM1			C			I2			I1		
S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M
25.33	16.33	11.50	46.00	37.66	27.00	7.66	7.33	2.33	5.66	8.00	6.00	2.00	0.00	0.00	1.66	0.00	0.00	3.00	0.00	0.00
8.29	4.67	4.38	7.48	7.06	10.24	2.68	2.49	3.35	6.67	5.41	6.43	2.00	0.00	0.00	2.42	0.00	0.00	3.60	0.00	0.00

Mandibular - right

M2			M1			PM2			PM1			C			I2			I1		
S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M
23.66	20.00	5.66	37.00	35.33	16.00	4.00	7.00	2.33	3.33	5.33	4.00	2.00	0.00	0.00	2.33	1.00	0.00	3.00	0.00	0.00
5.82	3.82	3.24	10.18	9.06	5.88	3.05	3.78	3.35	2.45	3.19	3.05	2.00	0.00	0.00	2.42	2.23	0.00	3.60	0.00	0.00

WOMEN

Maxillary - left

M2			M1			PM2			PM1			C			I2			I1		
S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M
19.16	10.66	7.33	31.33	29.66	19.66	7.83	6.66	1.66	10.66	5.66	4.33	1.33	0.33	0.00	5.00	0.33	1.00	2.00	0.00	1.00
5.17	2.49	4.10	11.35	6.87	8.44	5.89	2.49	2.42	12.09	3.14	4.38	1.88	0.74	0.00	3.21	0.74	2.23	2.00	0.00	1.52

Maxillary - right

M2			M1			PM2			PM1			C			I2			I1		
S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M
20.66	13.00	5.33	31.00	31.66	16.66	7.66	4.33	0.66	8.66	6.00	2.33	0.66	0.00	0.00	2.66	0.33	0.00	3.66	0.00	1.33
4.42	6.60	2.74	9.00	10.54	8.76	10.35	3.72	1.49	4.71	5.16	2.42	1.45	0.00	0.00	1.88	0.74	0.00	3.35	0.00	1.88

Mandibular - left

M2			M1			PM2			PM1			C			I2			I1		
S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M
31.50	17.00	15.66	45.33	44.66	34.33	9.00	5.66	2.66	5.33	4.00	6.00	0.66	0.00	0.66	2.00	0.00	0.00	1.33	0.33	0.00
12.56	5.13	8.28	10.24	5.85	12.13	6.29	4.23	4.42	6.79	3.05	5.77	1.49	0.00	1.49	2.00	0.00	0.00	1.88	0.74	0.00

Mandibular - right

M2			M1			PM2			PM1			C			I2			I1		
S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M	S	A	M
24.66	16.33	13.66	44.83	41.33	28.66	9.00	5.66	3.33	3.66	5.00	2.66	0.66	0.00	0.00	2.00	0.00	0.00	2.00	0.33	1.66
8.37	6.04	8.11	15.14	9.70	10.99	5.25	2.42	4.26	1.79	3.95	2.21	1.49	0.00	0.00	2.00	0.00	0.00	2.00	0.74	2.42

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The caries incidence in the men of the three regions isn't symmetrical, being higher in the left side. It isn't observed in women. In both sexes there is a higher dental decay incidence in the pieces of the jaw than in the maxilar ones.

*Second molar:* This piece shows a lower caries incidence if it's compared with the first molar, but lateral differences in the caries incidence have not been observed.

In the three regions and for both sexes, the caries incidence in the first two inferior molars is higher than in the superior ones. We have observed a gradation in caries incidence among the three regions, in this order from high to low incidence: Alcarria, Sierra and Mancha, for both sexes.

Differences are significant in the men from the three regions. In the women there are significant differences between Sierra-Alcarria and Sierra-Mancha (Table 2).

Table 2. Chi-quadrat test for dental decay incidence\*

M 1		Boys	Girls	M2	
		Boys	Girls	Boys	Girls
MXR	SAM	5.92*	4.43*	4.60	9.09***
	SA	1.98	0.82	1.58	9.09*****
	SM	5.00**	4.40**	4.01**	4.57**
	AM	4.86**	3.65*	3.60*	4.51**
MDR	SAM	9.25*****	4.12	11.01*****	3.61
	SA	3.12*	1.70	3.94**	2.47
	SM	8.07*****	3.87**	10.24*****	3.42*
	AM	7.31****	2.66	7.84****	1.33
MXL	SAM	8.24***	4.27	11.14*****	2.95
	SA	4.06**	2.63	3.72*	1.02
	SM	8.24*****	4.17**	9.37*****	2.67
	AM	4.19**	1.73	9.19*****	2.22
MDL	SAM	5.56*	7.21**	4.97	1.83
	SA	3.37*	5.88***	1.34	0.61
	SM	5.45***	6.32***	4.93**	1.58
	AM	2.29	2.42	3.66*	1.47

\* Abbreviations: MX: maxillary, MD: mandible; L: left, R: right; S: Sierra, A: Alcarria, M: Mancha; Significant at level: p < 0.005\*\*\*\*\*; p < 0.01\*\*\*\*; p < 0.025\*\*\*; p < 0.05\*\*; p < 0.1\*

## Conclusions

According to the parent's profession, the Mancha has a lower population devoted to agriculture and higher number of qualified industrial workers. The Mancha is a flat region, with mechanized agriculture and modern systems of irrigation. These are the causes why the Mancha has higher income levels than the other two regions, and at the same time, a really lower incidence of caries (Fig. 1).

No significant differences are observed in the intake of carbohydrates in the three regions.

So the economic-status determines the familiar resources spent on health and cleanness of the mouth.

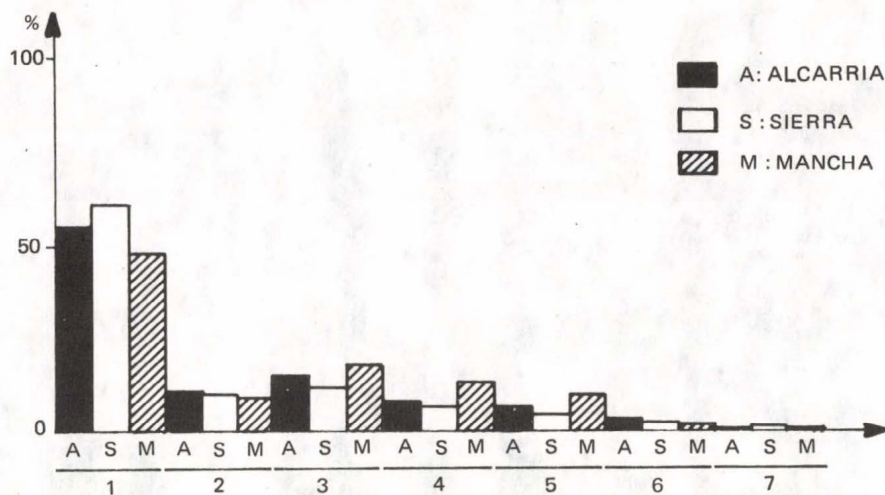


Fig. 1: Father's profession: 1. Farming, 2. Unskilled worker, 3. Skilled worker, 4. Employee, 5. Industrialist, 6. Administrative, 7. Liberal profession

During the collection of data we observed a higher care and cleaning of the mouth in the Mancha region.

In Spain, the National Health Service only extracts the pieces with caries. A preventive medicine through fillings, prothesis for the correction of the teeth position, is only accessible to families with higher incomes. To eliminate these economic discriminations and get a population with a healthy mouth it's only possible if we carry out a true social sanitary policy.

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