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***DENTAL CARIES IN SOME MEDIEVAL
SPANISH POPULATIONS***

ABSTRACT

Six masculine Medieval skeletal series from rural Spain have been examined in order to provide paleopathological data and information to contribute to the paleoecological studies.

The 2298 teeth belonging to 153 individuals have been studied macroscopically by the same observer.

The percentages of individuals affected by dental caries are, 53.6% (35.7%-67.7%), and the frequencies of carious teeth, to the total number, are, 8.1% (3.3%-10.3%). In this respect, the population of the Monastery of Suso (S. Millán de la Cogolla, La Rioja) enjoyed a better life quality than the other five.

RESUMEN

Se han examinado seis series esqueléticas masculinas medievales de la España rural con el fin de proporcionar datos paleopatológicos e información para contribuir a los estudios paleoecológicos.

Los 2298 dientes pertenecientes a 153 individuos han sido estudiados macroscópicamente por un mismo observador.

Los porcentajes de individuos afectados por caries dentales son, 53.6% (35.7-67.7%), y las frecuencias de dientes con caries, en relación al número total de piezas, son, 8.1% (3.3-10.3%). Respecto a este indicador, la población del Monasterio de Suso (S. Millán de la Cogolla, La Rioja) gozaba de una mejor calidad de vida que las otras cinco.

PALABRAS CLAVE: Paleopatología, Paleoecología, Caries dental.

INTRODUCTION

The study of human dentition has been an important area of investigation throughout much of the history of Paleopathology and Paleoecology. In this regard, the analysis of dental caries has proved of immense value in understanding the relationship between diet and dental health¹.

The present paper examines six masculine Medieval skeletal samples from rural Spain in order to provide paleopathological data and information to contribute to the paleoecological studies.

A. Riera and other authors² assure that the Medieval Spanish peasants (the social class that is concerned here) had a type of diet that used to vary following the season; it was mainly composed of what the land produced and some animal proteins, in small quantities, coming from hunting or from the animals they raised.

MATERIALS AND METHODS

The six dental samples come from the following Spanish maculine populations:

- 1.- Villanueva de Soportilla (Burgos), 9-12th centuries: 31 individuals and 456 teeth³.
- 2.- La Torrecilla (Arenas del Rey, Granada), 9-10th to the 13-14th centuries: 45 individuals and 818 teeth⁴.
- 3.- Monastery of Suso (San Millán de la Cogolla, La Rioja), 10-11th centuries: 14 individuals and 184 teeth⁵.

1. KELLEY, MARC A.; LEVESQUE, DIANNE R.; WEIDL, ERIC: *Contrasting patterns of dental disease in five Early Northern Chilean groups*.- In "Advances in dental Anthropology".- Wiley-Liss.- New York, 1991, 203-213; LARSEN, C.S.; SHAVIT, R.; GRIFFIN, M.C.: *Dental caries evidence for dietary change: an archaeological context*.- In "Advances in dental Anthropology".- Wiley-Liss.- New York, 1991, 179-202; and POWELL, M.L.: *The analysis of dental wear and caries for dietary reconstruction*.- In "The analysis of Prehistoric diets".- Academic Press.- Orlando (Florida), 1985, 307-338.

2. A. RIERA in GALERA, VIRGINIA: *La población medieval cántabra de Santa María de Hito*.- Tesis Doctoral.- Univ. de Alcalá de Henares, 1989.- 264 y XXVI p.; and SOUICH, PHILIPPE DU; PEREZ-PEREZ, ALEJANDRO: *Notas sobre la alimentación en el Reino de Granada y análisis de oligoelementos en La Torrecilla (Arenas del Rey, Granada)*.- "Cuad. de Prehist. de la Univ. de Granada" (Granada), 17 (1993), in press.

3. SOUICH, PHILIPPE DU; BOTELLA, MIGUEL C.; RUIZ, LUIS: *Antropología de la población medieval de Villanueva de Soportilla (Burgos)*.- "Antrop. y Paleoecol. Humana" (Granada), 6 (1991), 57-83.

4. SOUICH, PHILIPPE DU: *Estudio antropológico de la necrópolis medieval de La Torrecilla (Arenas del Rey, Granada)*.- "Antrop. y Paleoecol. Humana" (Granada), 1 (1979), 27-40.

5. ANDRIO, JOSEFINA; MARTIN, ENCARNA; SOUICH, PHILIPPE DU: *La necrópolis medieval del Monasterio de San Millán de la Cogolla de Suso (La Rioja)*.- "Berceo" (Logroño), 130

4.- El Castillo (Palacios de la Sierra, Burgos), 10-13th centuries: 42 individuals and 479 teeth⁶.

5.- Santa María de la Piscina (San Vicente de la Sonsierra, La Rioja), 10-14th centuries: 11 individuals and 169 teeth⁷.

6.- San Baudelio de Berlanga (Berlanga de Duero, Soria), 12th century: 10 individuals and 192 teeth⁸.

The skeletal remains considered here are adult, mature or senile in age. The same observer studied the 2298 teeth belonging to the six osteological collections (153 individuals).

"Each tooth was examined macroscopically on all visible surfaces. Only those cavities that would admit the tip of a dental explorer were scored as actual caries, to eliminate false scoring of discolored but intact enamel"⁹. "These lesions ranged in size from small pits to total crown destruction. In extreme instances, crown destruction was accompanied by loss of part or most of the tooth root"¹⁰. For caries diagnostic methods, see also E. A. M. KIDD¹¹.

The authors are fully aware "that most antemortem tooth loss results from tooth decay. For many samples, this will be the case, but for peoples experiencing heavy attrition, severe periodontal disease, or tooth breakage with pulp chamber exposure, tooth loss can also occur"¹². As these causes are difficult or impossible to

(1996), 49-106; and MARTIN, ENCARNACIÓN; SOUICH, PHILIPPE DU: *Estudio antropológico de la necrópolis altomedieval del Monasterio de Suso (S. Millán de la Cogolla, Logroño)*.- "Antrop. y Paleocol. Humana" (Granada), 2 (1981), 3-20.

6. SOUICH, PHILIPPE DU; BOTELLA, MIGUEL C.; RUIZ, LUIS: *Antropología de la población medieval de Palacios de la Sierra (Burgos)*.- "Bol. de la Soc. Esp. de Antrop. Biol." (Madrid), 11 (1990), 117-146.

7. LOYOLA, ESTHER; ANDRIO, JOSEFINA; HERAS, M^a ANGELES DE LAS; SOUICH, PHILIPPE DU; MARTIN, ENCARNACIÓN: *El conjunto arqueológico de Santa María de la Piscina (S. Vicente de la Sonsierra)*.- Gobierno de La Rioja, Inst. de Est. Riojanos.- Logroño, 1990.- 87 p.; and SOUICH, PHILIPPE DU; MARTIN, ENCARNACIÓN: *Los restos antropológicos de la necrópolis medieval de Santa María de la Piscina (S. Vicente de la Sonsierra, Logroño)*.- In "5 Trabajos de Antropología Física".- Lab. de Antrop., Inst. "F. Olóriz", Fac. de Medicina.- Granada, 1982, 30-41.

8. SOUICH, PHILIPPE DU; MARTIN, ENCARNACIÓN; BOTELLA, MIGUEL C.: *Los restos antropológicos de la necrópolis medieval de San Baudelio de Berlanga (Berlanga de Duero, Soria)*.- In "5 Trabajos de Antropología Física".- Lab. de Antrop., Inst. "F. Olóriz", Fac. de Medicina.- Granada, 1982, 78-103.

9. Ver POWELL, M.L. en nota 1.

10. Ver LARSEN *et alii* en nota 1.

11. KIDD, E.A.M.: *A critical evaluation of caries diagnostic methods and epidemiological methods. Can we trust the available data?*.- In "Risk markers for oral diseases. 1. Dental caries".- C.U.P.- Cambridge, 1991, 15-32.

12. Ver KELLEY *et alii* en nota 1.

discern, only the frequencies, in percentages, of individuals and teeth affected by dental caries are reported.

RESULTS AND DISCUSSION

The results (Table 1) range from the Monastery of Suso (35.7% of individuals with dental caries and 3.3% of the teeth affected) to Villanueva de Sotopilla (67.7% and 10.3%); showing great variability due, in part, to the not very large number of individuals and teeth, and to the different ways and states of individuals and teeth, and to the different ways and states of conservation of the skeletal remains. The less affected teeth are the incisors and canines.

POPULATION	INDIVIDUALS	TEETH	e(x)
Villanueva	67.7 (21)	10.3 (47)	17.1
La Torrecilla	55.6 (25)	7.0 (57)	17.4
Suso	35.7 (5)	3.3 (6)	21.6
El Castillo	50.0 (21)	9.8 (47)	20.7
Santa María	36.4 (4)	10.1 (17)	19.3
San Baudelio	60.0 (6)	6.8 (13)	13.3
Total	53.6 (82)	8.1 (187)	-

Table 1. Frequencies and numbers of individuals and teeth affected by dental caries, and life expectancies at 21¹³.

During the Neolithic and the Age of Metals, between 10 and 33% of the adults must have suffered from caries; in Gallic and Roman times, from 30 to 40% of the adults were affected; at the end of the Middle Ages this percentage reached 50% and even more; nowadays the caries affects 90 or 100% of the adult Europeans¹⁴.

13. BOTELLA, MIGUEL C.; SOUICH, PHILIPPE DU; RUIZ, LUIS: *La esperanza de vida en varias poblaciones medievales españolas*.- In "Actas del II Congreso Nacional de Paleopatología".- Asoc. Esp. de Paleopatol., Univ. de Valencia.- Valencia, 1993, 85-88.

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The percentages found in this study, 53.6% (35.7%-67.7%) of the adult males, match the figures just mentioned.

In Gallic and Roman times, and in the Middle Ages, the frequencies of the affected teeth, as a percentage of the total present teeth, varied from 5 to 14%, nowadays these figures reach 50 to 60% in the adult¹⁵. The frequencies found in the present study, 8.1% (3.3- 10.3%) of the total number of teeth, confirm the findings obtained in other countries¹⁶ (See also Table 2: comparisons in Spain).

The sample of population from the Monastery of Suso exhibits (Table 1) the lowest figures of dental caries and the best life expectancy¹⁷.

Chi-square analyses have revealed no significant difference between the populations of affected individuals ($X= 6.060$, $df= 5$, $p= 0.3004$); significant difference between the series of affected teeth ($X= 13.332$, $df= 5$, $p= 0.0205$), but the statistical difference disappears if we remove the teeth collection of the Monastery of Suso ($X= 6.655$, $df= 4$, $p= 0.1553$).

Gorafe (1)	3.7
Rafal Rubí (2)	3.6
Ricardo Squella (3)	8.0
Romans from Ampurias (4)	10.8
Present study	8.1
Convent of Ampurias (5)	11.2
(1) Granada, Bronze Age ¹⁸ . (2) Alayor, Menorca; from the 15th century BC to Preroman times ¹⁹ . (3) Algayarens, Ciudadela, Menorca; last centuries BC ²⁰ . (4) Gerona ²¹ . (5) Gerona, 16-19th centuries ²² .	

Table 2. Dental caries frequencies (%) in several populations and ages (Spain).

15. Ver nota 14.

16. Ver nota 14.

17. Ver nota 13.

18. SOUICH, PHILIPPE DU: *Estudio antropológico de los dientes de una población del Bronce I de Gorafe (Granada)*.- "Anal. del Desarr." (Granada), XVIII (44-45) (1974), 137-166.

19. SOUICH, PHILIPPE DU; BOTELLA, MIGUEL C.: *Los materiales antropológicos de la naveta de Rafal Rubí y otros restos del Museo Provincial de Bellas Artes de Mahón (Menorca)*.- "Pyrenae" (Barcelona), XII (1976), 7-33.

Provisionally, waiting for additional investigations about other pathologies and other stress markers, and viewing the present results, it can be inferred that life quality in the old and famous Monastery of Suso was better than in the other five Medieval Spanish sites studied here.

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21. JOSE PONS in FUSTE, MIGUEL: *Cráneos procedentes de la necrópolis de San Quirze de Galliners (Barcelona)*. *Contribución al problema de los "Negroides Neolíticos"*.- "Trab. Inst. "B. de Saha-gún" de Antrop. y Etnol." (Barcelona), XIII (1) (1952), 6-10.

22. Ver nota 21.