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## **PROBLEMAS DE DESARROLLO DENTARIO EN LOS NIÑOS MEDIEVALES DE SERPA (PORTUGAL)**

*RESUMEN: Entre Julio de 1998 y Julio de 1999, un equipo de arqueólogos y antropólogos ha procedido a la exhumación de 112 esqueletos en el Yacimiento de la Zona Occidental de Serpa (Sur de Portugal). Se piensa que esta necrópolis ha sido utilizada entre los siglos XIII y XVI (resultado obtenido a partir del análisis de radiocarbono).*

*La importancia de esta necrópolis se debe a su larga extensión, al hecho de que todas las tumbas son individuales y a la elevada representatividad de no-adultos (80 por ciento). Debemos destacar la elevada presencia de hipoplasias del esmalte dentario indicativas de períodos de estrés ocurridos durante el crecimiento.*

*En este trabajo se presentan los resultados referentes al estudio de las Hipoplasias Lineales del Esmalte Dentario de 60 individuos no-adultos, con edades comprendidas entre los 2 y 15 años, así como otras alteraciones del desarrollo dentario, tales como, foramen caecum y amelogénesis imperfecta.*

*PALABRAS CLAVE: Medieval, no-adultos, desarrollo, hipoplasias.*

*ABSTRACT: From July 1998 to July 1999, a group of archaeologists and anthropologists proceeded to the exhumation of 112 skeletons from the Loteamento da Zona Poente de Serpa (South of Portugal). It is thought that this necropolis had probably been used between the 13th and 16th centuries (results obtained by radiocarbon dating analyses).*

*The importance of this necropolis is due to its large extension, as well as the fact that all graves are individual and haven't been used more than once, and the large number of non-adults individuals (80 %) that in general display a high prevalence of enamel hypoplasias that could indicate stress periods occurred during growth development.*

*This paper reports the results of the study of linear enamel hypoplasias, as well as other dental development problems such as foramen caecum molare and imperfect amelogenesis, in a sample of 55 non-adults, with ages between 2 and 15 years.*

*KEY WORDS: Medieval, non-adults, development, hypoplasias.*

### **INTRODUCTION**

This presentation reports the results of a study of dental development problems in a sample of 55

non-adults from a medieval necropolis in Serpa (South of Portugal) (Figure 1) (Table 1) which stands out for its high representativity of non-adult individuals (80% of the total sample).

**Table 1: Results obtained by radiocarbon dating analyses for *Serpa necropolis*.**

Beta - 151126	570+-80BP	Cal AD 1280 to 1460 (Cal BP 670 to 496) (2 sigma).
Beta - 151127	450+-60BP	Cal AD 1400 to 1520 (Cal BP 550 to 430) and (Cal BP 380 to 320) (2 sigma).

With the purpose of detecting dental defects related with nutritional stress episodes, some enamel defects were analysed, such as linear enamel hypoplasias, *foramen caecum molare* and *amelogenesis imperfecta*.

**MATERIAL AND METHODS**

The sample refers to 798 permanent teeth from 55 non-adult individuals with ages between 2 and 15 years (Ferembach *et al.*, 1980) (Figure 2).

Only linear hypoplasias were considered and analysed. All observations were made through naked eye, therefore eliminating any possible confusions with perikymata. Goodman & Rose's (1991) crown development diagram for the human permanent dentition was used for the chronological conversion of the enamel hypoplasias.

Moreover, each tooth was observed more than once by at least two authors, reducing intra and inter observer error.

**RESULTS**

Linear enamel hypoplasias:

In general, enamel hypoplasias refer to all defects in enamel thickness as a result of systemic growth disturbances. In this sense, it is a potential indicator of past nutritional status (Goodman & Rose, 1991) (Figure 3 and 5).

28% of the teeth show hypoplasias (220/798), were 319 linear enamel hypoplasias were recorded. Due to the fact that in 8% of the teeth (58 teeth) the crown formation was not complete, only 20% of the teeth were analyzed (162/798), and 254 linear enamel hypoplasias were measured (80%).

The most hypoplastic tooth is the upper central incisor (Figure 6). And the highest prevalence of enamel hypoplasias was observed in 2-4 years age group (Figure 4).

*Foramen caecum molare*:

*Foramen caecum molare* is an enamel defect that occurs during enamel growth and which, in a sense, can be described as a local and circular enamel agenesis (Capasso & Tota, 1992).

It is caused by genetic and/or environmental fac-

tors, such as systematic physiological disturbances that can lead to disruptions in the process of amelogenesis or enamel formation.

We found 10 *foramina caecum molare* in the buccal surface of 10 molar teeth in 8 non-adults (Figure 7).

*Amelogenesis imperfecta*:

*Amelogenesis imperfecta* is an enamel defect in which a group of ameloblasts suffers a growth disruption, loses its functional capacities and less matrix is formed (Maló de Abreu, personal communication).

In an upper left PM1 (Figure 8) a wide circular sulcus near the cemento-enamel junction was observed and diagnosed as an imperfect amelogenesis.

**CONCLUSIONS**

The highest prevalence of enamel hypoplasias was observed in the 2-4 years age group. This period could be related to weaning, a period in which, by its critical changes in nourishment, could provoke malnutrition and infectious diseases. It is also a period of dental development that can be followed by fevers, diarrhea and consequent lack of appetite provoked by nutritional changes.

Furthermore, it is important to note that enamel development is sensitive to a wide spectrum of physiological and metabolic changes.

Nevertheless, the high frequencies found could still be due to a slight over estimation, since some of the lines could be perikymata.

**ACKNOWLEDGEMENTS**

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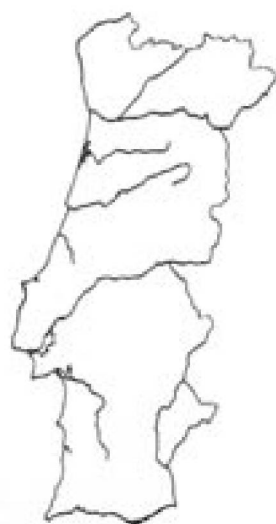
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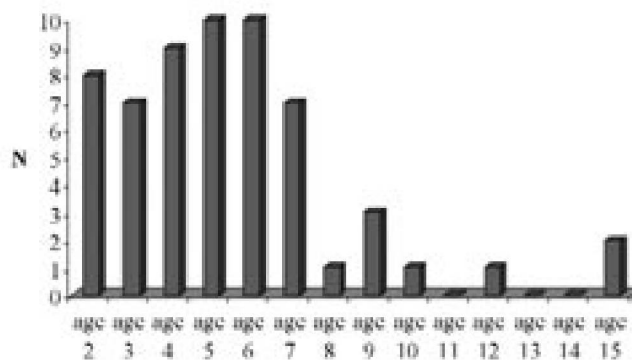
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## PROBLEMAS DE DESARROLLO DENTARIO EN LOS NIÑOS MEDIEVALES DE SERPA (PORTUGAL)

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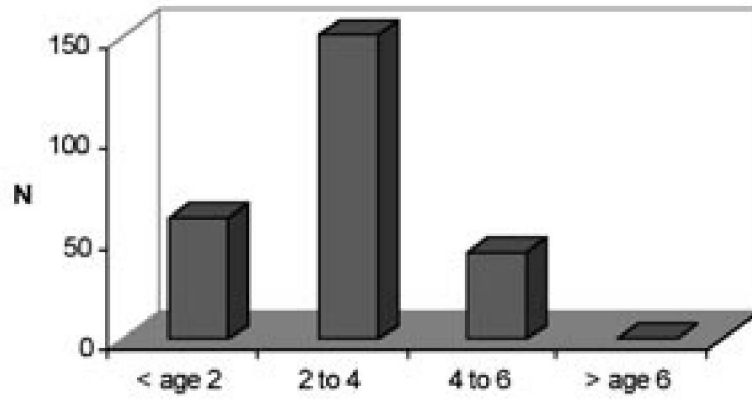
**Figure 1.** Localization of Serpa in the portuguese context.



**Figure 2.** Age at death distribution of the sample.



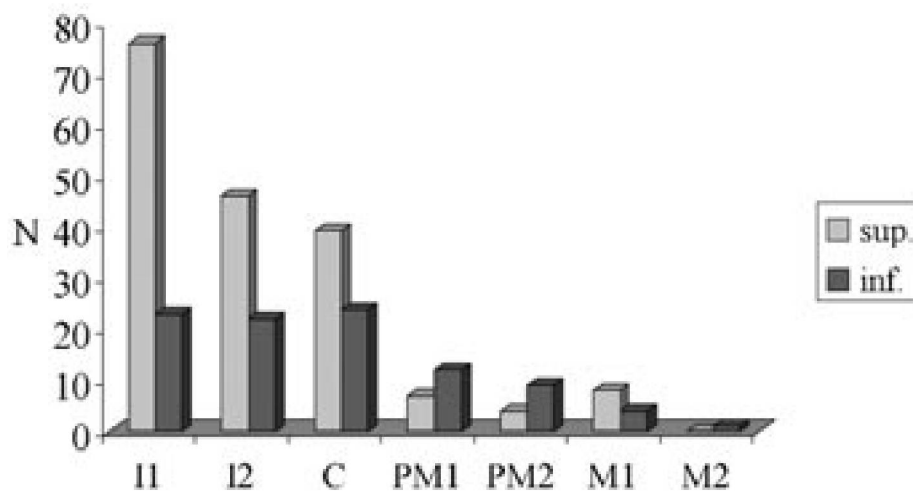
**Figure 3.** Dental enamel hypoplasias in a 15 year old juvenil.



**Figure 4.** Linear enamel hypoplasias per age.



**Figure 5.** Dental enamel hypoplasias in a 6 year old child.



**Figure 6.** Dental enamel hypoplasias distribution by tooth type.



**Figure 7.** Foramen molare caecum in a left inferior M1 from a 4 year old child.



**Figure 8.** Amelogenesis imperfecta in a 6 year old child.