

Stressed Out: Amelogenesis disrupts as an indicator of nutritional deficiencies in an XVIIIth and XIXth century cemetery from “Las Trinitarias” Church, Madrid. A preliminary report.

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AMELOGENESIS DISRUPTS AS AN INDICATOR OF NUTRITIONAL DEFICIENCIES IN AN XVIII th AND XIX th CENTURY CEMETERY FROM “LAS TRINITARIAS” CHURCH, MADRID.

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INTRODUCTION

During the search of the Cervantes’s remains in 2015, a sample of 450 subadult skeletons was exhumed from the crypt of the Trinitarias Church in Madrid. It was observed that in those remains dated from the last XVIIIth to the XIXth century, there was a high frequency of paleopathological indicators of rickets or vitamin D deficit (>60% of the individuals). The goal of the research is to study the frequency of amelogenesis disruptions as well as its etiology based on biological and sociological principles. Furthermore, the location of the disruptions was studied in order to estimate the age in which the event occurred.

MATERIAL AND METHODS

The enamel anomalies of each tooth from 13 individuals were classified in 6 groups according to the severity and location based on the FDI criteria¹ (table 1). The estimation of age was carried out using Al Qahtani’s Atlas².

Type 1	Opacity from white to cream.	Type 2	Opacity from yellow to brown
Type 3	Presence of pits	Type 4	Presence of horizontal grooves
Type 5	Presence of vertical grooves	Type 6	Absence of enamel

Table 1: Types of hypoplasia according to FDI criteria



RESULTS

Regarding to the dental pathologies that were found in the sample, 13 cases with serious amelogenesis alterations (Hypocalcification and hypoplasia) are presented in individuals from 0 to 3 years old. Frequencies of the enamel anomalies were observed and included in the table 2. Furthermore, the location of the disruptions was studied in order to estimate the age. The average of the age (expressed in months) when the event took place is included in table 3.

Dec.teeth	55	54	53	52	51	61	62	63	64	65
Type I	0	66,6	28,6	28,6	75,0	50,0	50,0	60,0	57,2	50,0
Type II	100	33,3	71,4	57,2	37,5	40,0	75,0	60,0	42,9	0,0
Type III	33,3	11,1	28,6	14,3	0	10,0	12,5	40,0	14,3	100
Type IV	0	11,1	14,3	28,6	50,0	40,0	25,0	0	14,3	0
Hypoplasia	85	84	83	82	81	71	72	73	74	75
Type I	0	40,0	20,0	25,0	0	14,3	40,0	20,0	40,0	20,0
Type II	0	60,0	80,0	75,0	100	57,2	80,0	80,0	80,0	60,0
Type III	0	0	20,0	0	0	14,3	0	0	0	20,0
Type IV	0	20,0	20,0	25,0	75,0	42,9	40,0	40,0	20,0	40,0

Table 2: Frequency of hypoplasia of the deciduous teeth

Dec.teeth	55	54	53	52	51	61	62	63	64	65
Type I	0	5,2	10,5	2,7	2,2	2,12	2,7	7,5	3,9	7,5
Type II	15,0	9	6,1	1,6	36*	1,3	2,6	3,0	5,2	0
Type III	10,5	7,5	6,7	1	-	1	2,5	6	3	4,5
Type IV	-	10,5	10,5	2,2	3	2,8	2,2	-	10,5	-
Hypoplasia	85	84	83	82	81	71	72	73	74	75
Type I	-	4,2	2,2	1,5	1,5	1,5	0,5	4,5	3,7	1,5
Type II	-	6	7,7	1,5	2	2	3,5	6,7	7,8	9,2
Type III	-	-	2,2	-	-	0	-	-	-	1,5
Type IV	-	7,5	9	1,5	2,2	3,7	3	9	9	8,6

* weeks during pregnancy

Table 3: Mean of age when the hypoplasia took place (in months) of the deciduous teeth

DISCUSSION AND CONCLUSIONS

A 60% from the total sample of 450 subadult skeletons with severe signs of rickets was founded in the Trinitarias Church. However, just 13 cases show also serious amelogenesis alterations. Those disruptions when isolated can be due to local infections or traumatismos, while when they are generalized they can be a consequence of several factors such as metabolic disorder, infectious diseases, nutritional deficiencies and even genetic alterations³. It can be concluded that in the present research it can not be merely related to vitamin D deficiencies.

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