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Dento-alveolar features and diet in an Etruscan population (6th–3rd c. B.C.) from northeast Italy

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ABSTRACT

Objectives: The purpose of this study was to assess the prevalence of some dento-alveolar features (caries, dental calculus, tooth wear, enamel hypoplasia, abscesses, retraction of the alveolar bone, chipping, and *ante mortem* tooth loss) on an Iron Age sample from the Etruscan necropolis of Spina (North-Eastern Italy) and to make a relation with dietary evidence found in the archaeological records. These dental features were used to evaluate the oral health status and dietary habits with the aim of shedding light on the lifestyle and living conditions of this population.

Materials and methods: The sample analysed consisted of 680 permanent teeth from 80 burials.

Results: Overall, individuals at Spina exhibited a low incidence of caries, abscesses and *ante mortem* tooth loss, high calculus rates and severe attrition, suggesting a subsistence pattern based on a mixture of fishing, pastoralism and agriculture. The low incidence of hypoplasia was probably related to their good nutritional conditions and weak metabolic stresses during early childhood.

Conclusions: These findings, quite similar to those of Etruscans from other parts of Italy, are very different from those of other populations living in the same territory during the same time. This pattern is indicative of a general good health status in this Iron Age population and may be related, at least in part, to the Etruscan diet.

1. Introduction

In an archaeological context, teeth and their pathologies are a source of information on the lifestyle and behaviour within a community, providing valuable clues regarding diet, nutrition and subsistence.[1] Many previous studies have discussed how changing patterns of dental disease were related to cultural and dietary changes.[2–6]

Considering the archaeological evidence and anthropological records as in previous studies on other ancient populations,[7–9] the purpose of this paper is to analyse some dental indicators (tooth loss, caries, calculus, wear, periodontal disease, abscesses, hypoplastic defects and chipping) in the Etruscan population of Spina (Ferrara, VI–III c. B.C.) as a tool to assess the general health status, lifestyle and diet of this population. Therefore the results of this paper are intended to provide a contribution to the knowledge of this population still largely unknown by an anthropological point of view.

Etruscans are known as the first great pre-roman civilisation of the Italian peninsula. The population analysed in this study lived in Etruria Padana, in the Po Valley (North-eastern Italy) (Fig. 1). During the period from the end of 6th to the 3rd c. B.C. Spina, a great commercial port on the Adriatic, was a

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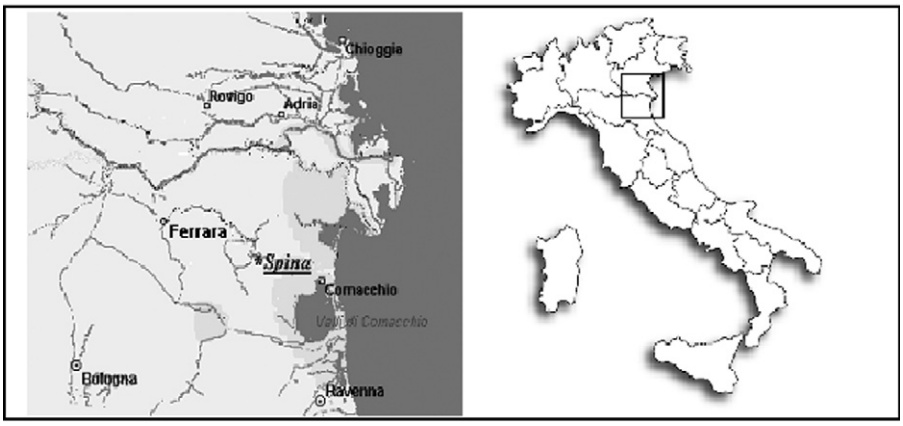

Fig. 1 – The archaeological context: on the left the Etruscan site in the Po Valley area, on the right the geographical location of this area in northern Italy.

lagoon city dispersed over several small islands surrounded by channels and was protected by strong embankments. It was surrounded by flood plains which separated the centre of inhabitation from the coast and its necropolis was located on the sand dunes outside the city.[10] Two different types of burial places have been reported: the most common refers to burial of the corpse in a simple pit, but crematory urns have also been unearthed.[11] From an archaeological perspective, one of the most important elements of these types of burial is the richness of the materials comprising the funeral outfit, even if the epigraphic record, mainly from tomb inscriptions, refers to only two social classes, craftsmen and merchants.[12] Unfortunately, the life of this thriving city came to an end due to the encroachment of sand and the siege by the Celts.

In ancient Etruria the archaeological discovery of some bronze agricultural tools (sickles, scythes, etc.) demonstrates an advanced agriculture.[13] In addition to cereals, the Etruscans cultivated the vine to produce and commercialise the wine. A number of domestic animal remains – pigs, especially – were found. The attested presence of dogs may be related both to herding animals and hunting. Hunting was also evidenced by the discovery of remains of wild game in domestic contexts. In this respect we may mention the wall-painting in the Etruscan Golini I's tomb (Orvieto), representing the banquet setting with domestic and wild animals.[14] Fishing was also carried out by the Etruscans, as demonstrated by the finding of hooks and harpoons, in addition to fish remains and shells, and to fish plates.[15]

Furthermore, given the quite good archaeological evidence of the diet of this population, this study is also a test of the informative efficiency of the dento-alveolar features, as indicators of life conditions.

2. Materials and methods

The sample examined derives from the site at Spina, located in the marshes of Comacchio (Ferrara) and discovered in 1920, during reclamation of the land. The skeletal remains used for this study include adult females and males buried between the 6th and the 3rd c. B.C. Immature individuals were excluded from the study.The sex and age at death of each individual were determined using standard anthropological methods.[16–20]

On the basis of skeletal age, the sample was classified into the following two groups: ≤35 years old and over 35 years old.

The survey on dental indicators in this Etruscan sample (80 burials) was performed on a total of 680 permanent teeth. In order to determine whether the teeth loss was *ante* or *post mortem*, the teeth sockets were analysed. All permanent teeth were examined macroscopically for evidence of pathology and using a magnifying glass.

The number of subjects, sex distribution, number and type of the analysed teeth are presented in Tables 1 and 2.

Dental features analysed and recorded for each tooth and individual included: caries, dental calculus, tooth wear, linear enamel hypoplasia (LEH), abscesses, periodontal disease, chipping and *ante mortem* tooth loss (AMTL). This list of particular conditions, also if not exhaustive of dental features, was selected as these are the most frequently recorded indicators of alimentary pattern and oral health status according to literature.[21–23] Caries were assessed macroscopically according to Lukacs,[1] using a dental probe, and based on dimensions, surface and location on the tooth. Four degrees of severity were subsequently defined: (1) pit or small fissure caries, (2) larger caries with less than one/half of the crown destroyed, (3) those with more than half of the crown destroyed, and (4) teeth with only the roots remaining. The location of each cavity was defined according to the corresponding surface (occlusal, coronal, cervical and radical) and side (buccal, lingual, interproximal-mesial and interproximal-distal) affected.[24] Calculus deposits were documented for all teeth according to Palubeckaitè et al.,[25] and the degree of calculus formation was employed to classify deposits as: (1) less than 1/3 of the crown covered, (2) 1/3–2/3 of the crown covered, and (3) more than 2/3s of crown covered. Calculus position (buccal and lingual surface) was also recorded. The degree of dental wear was recorded for the occlusal surface of each tooth, according to Smith,[2] grouping the degrees of wear into slight (degrees 1 and 2), intermediate (degrees 3 and 4), and heavy (degrees 5–8). LEH was scored according to the current criteria.[26] The age of LEH formation was determined