Pathological lesions attributable to vitamin deficiency in skeletal remains from Puy St. Pierre (Briançon, France)

The aim of the present study was to evaluate the presence of pathological alterations attributable to vitamin deficiency in osteological remains from the church of St. Pierre in Puy de St. Pierre, Briançon, France.

We recorded alterations referable to scurvy, an acquired osteodystrophy due to vitamin C deficiency, which causes both skeletal and vascular lesions in humans. Scurvy presents a different clinical picture in children and adults: in the latter, it leaves skeletal signs on the palate and teeth.

The recording of osteodystrophies attributable to vitamin deficiency allowed us to make general inferences about the nutritional profile of the group under study.

The study of this pathology, as well as that of nutritional stresses, can be related to the geographical-environmental conditions of the population to which the sample belongs. This is important from the anthropological point of view, especially in order to examine alimentary habits within the context of the man-environment relationship.

Introduction

The study of alimentary habits is very important in anthropology, playing a determinant role in evaluation of the man-environment relationship.

The food supply derives largely from what the ecosystem produces, according to the nature of the soil and the climate. However, this productivity is often not sufficient to permit qualitatively and quantitatively complete alimentation.

Vitamin C is fundamental for humans: it stimulates the immune system, favours the robusticity and compactness of bones, helps the liver purify the organism of toxic substances and favours the intestinal absorption of iron. Vitamin C deficiency causes scurvy, i.e. acquired osteodystrophy, which produces skeletal and vascular lesions.
In humans, there is infant scurvy and adult scurvy, with different clinical pictures. Scorbutic children mainly present subperiosteal hemorrhagic lesions, usually in the ribs and shafts of long bones. In adults, the hemorrhages are in the epiphyses. In addition, skeletal signs are particularly evident in the palate and teeth, as shown by Zivanovic (1982) who underlined the frequent presence of palatal lesions attributable to scurvy in a medieval Mongol population. According to the same author, some lesions found in Cro-Magnon skeletons from Padina (Danube Valley) can be referred to scurvy.

Therefore, the presence of pathological skeletal lesions due to avitaminosis could be a good index to evaluate alimentary deficiencies (especially of vitamin C) in ancient populations.

Aim of the research

The aim of the present study was to evaluate the incidence of pathological lesions attributable to scurvy in skeletal remains discovered under the pavement of the Puy St. Pierre church in Puy de St. Pierre, France.

Puy de St. Pierre is a small community situated on a rocky promontory on the slopes of Mount Prorel in the Briançon area in the western Alps.

The alimentary habits of a mountain community, like that of Puy de St. Pierre, are influenced by the unfavourable environmental conditions caused by the high altitude and particularly long, harsh winters. In fact, in mountain communities the harvest of fresh vegetables is concentrated in a limited period of the year. Hence, their consumption is very low and cases of avitaminosis, especially scurvy, are frequent.

Sample, materials and methods

The material consists of 43 skulls, of which 81% complete with all anatomical parts and 19% incomplete.

The dating of the material, very approximate due to the lack of certain elements, placed the single burials in the XVI century and most of the ossuary depositions between the XVI and XVIII centuries (Berge, 1999; personal communication).

Anthropological studies showed that the sample consists of adult individuals. According to the diagnostic sexual traits on the bones of the skull, there are 14 males, 22 females and 7 indefinite specimens.

The material is well preserved, except for damage from physical agents (cold, fire). The skeletal surfaces are in good condition, although some show signs of thermal stress.

The method used for the palaeopathological analysis involved macroscopic observation of the specimens. We recorded skeletal signs due to nutritional deficiencies, par-