Hypertrophic Osteoarthropathy (HOA), also known by the “eponym” Marie-Bamberger’s disease, is a clinical syndrome characterized by periosteal new bone deposition, painful swelling of the joints, digital clubbing, and arthritic symptoms such as joint pain in the wrists, elbows, knees, and ankles.

The presence of periosteal reactions on the long and short tubular bones is described as the hallmark of HOA. Among the so-called Marie’s signs, certain typical features such as symmetry of lesions, their detachment from the bone cortex and the absence of endosteal involvement are considered.

### Sample & Methods

**Sample**

129 individuals (143 females and 168 males; 66 younger than 21 y.o. and 263 adults) from the Coimbra Skeleton Identified Collection were selected.

**Selected according to the cause of death:**

- Tuberculosis (TB) = 125 individuals;
- Pulmonary non-TB (e.g., pneumonia, bronchopneumonia, chronic bronchitis) = 62 individuals;
- Epitubercular and non-TB = 142 individuals.

### Results and Discussion

#### Upper Limb

In the individuals with HOA the skeletal elements more affected with new bone deposition were the radius (70%) and the ulna (70%). Values are highly significant (P<0.001) (Table 2).

The distribution of the periosteal reactions by bone and cause of death revealed significantly higher values in the TB group for the radius (χ² = 7.724, g = 2, P<0.05), ulna (χ² = 7.387, g = 2, P<0.05), scapula (χ² = 6.721, g = 2, P<0.05) and 2nd metacarpal (χ² = 9.003, g = 2, P<0.05), when compared with the remaining groups (Figure).

Differences were also found in the localization, with most of the individuals with TB presenting bilateral lesions. Nevertheless, only for the radius (χ² = 8.172, g = 4, P<0.05) and ulna (χ² = 6.780, g = 4, P<0.05) were the values statistically significant. Unilateral lesions were observed in the 1st, 2nd and 3rd metacarpal bones.

The scapula, radius, and ulna showed localized lesions that were significantly different in the TB group (P<0.05). It was only in the 1st metacarpal where diffuse new bone deposition was predominated.

In all tubular bones a moderate involvement of the periosteum (<1/2) was noted. The new bone recorded in the scapula, ulna, 1st and 2nd metacarpals was mainly of the woven type, showing significant differences in the TB group. Values equally significant were obtained for the radius, and in this case for the presence of both woven and lamellar bone.

#### Lower Limb

The bone elements most affected with HOA were the tibia (95.8%) and the fibula (73.3%), with values statistically significant, respectively χ² = 312.344, g = 1, P<0.01 and χ² = 236.278, g = 1, P<0.01 (Table 3).

The distribution of affected bones by cause of death revealed a high rate for the femora (n = 31), tibiae (n = 14) and fibulae (n = 10) in the TB group when compared with the other groups (Figure). Apart from the innominate, fibula and calcaneus, all the differences found were significant (P<0.05).

In the majority of bones, periosteal lesions were recorded, whose differences were statistically significant in the TB group, except for the innominate and calcaneus (P>0.05).

Excluding the tibia, fibula and 5th metatarsal, all bones revealed localized new bone deposition, more expressive in the TB group.

Considering severity, for the tubular bones moderate involvement of the shaft predominated (>1/2). However, there was heterogeneity for the type of bone observed, where both woven and lamellar bone predominated.

Radiographically a single layer of new bone was observed.

These results are in agreement with other studies where involvement of the tibiae, fibulae, radii, and ulnae are more common.

### Final Comments

This study, based on skeletons of known people who died before the development of antibiotics, agrees with clinical studies that have established a possible correlation between pulmonary conditions and HOA.

It is possible that the frequencies presented are an underestimate since the periosteal layer was not completely preserved in all cases and periosteal plaques of new bone are easily detached. This fact might have affected knowledge of the real prevalence, dispersion and severity of those with HOA.

Nevertheless, the data presented may help in differentially diagnosing the many instances of periosteal new bone formation found in archaeological samples.

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### Bibliography

5. [Cordoba-de la Rosa, M.; et al. (2010). “Hypertrophic Osteoarthropathy in Palaeopathology: A Review.”](#)