Iconographic approaches to the study of musculoskeletal stress markers

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Introduction

Paleopathologists examine both primary evidence (bones, calcified tissues, preserved bodies, and coprolites) and secondary sources such as contemporary documents and iconographic representations such as artifacts and works of art1-3.

Musculoskeletal Stress Markers: biocultural approach

Musculoskeletal markers (MSM) are distinct skeletal lesions that occur where a muscle, tendon or ligament inserts/origins into the bone surface4-6. Nevertheless, a profound gap remains between the type of bone lesion observed and the biomechanical forces produced by human gestures. The limitations identified are:

- Muscle insertion sites are morphologically complex7
- Lack of knowledge about the severity, duration and intensity of biomechanical forces produced by human gestures. The limitations identified are:
- Muscle groups respond to a complex mosaic of biomechanical stress8,9
- Multifactorial aetiology9

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MUSCULOSKELETAL STRESS MARKERS

As a result, a biocultural approach has been proposed bridging the biological information with historical and ethnographic data10. In this unifying perspective, the comparison with traditional living groups, the ethnographic study of material culture, iconographic portrayals or writing documents comprises a significant source of meaning in everyday activities interpretation.

Goals

To consider the usefulness of iconographic collections in the difficult task of understanding the musculoskeletal effects of occupation in past populations. For this propose will be described a corpus of artefacts from Africa representing fishing and hunting activities and stored at the Museum of Anthropology at the University of Coimbra.

Hunting

Angola Bochimanies or "Bushman": nomadic groups that live in deserted areas from Low Cunene (Namibia desert). The coastal populations gather fish, mollusks and plant roots. The inland groups are active hunters, using bows and arrows as hunting technologies.

Fishing

Fishing is a complex activity that involves multiple tasks. Some of them are amply described (e.g. use of double paddle boat and its bilateral effect in the upper limb). However, for the remaining activities, it is difficult to trace the accurate movement pattern. Nevertheless, sexual labour division is noted in these African groups, with males fishing in the sea, manufacturing, repairing and pulling nets and women fishing in rivers and lakes and carrying fish baskets. Besides the interpretative limitations of the iconographic record, it can be useful as a comparative tool, in conjunction with biological and other ethnohistorical sources.

Archery movements are well known and include three-phases: the stance, the drawing and the sighting11. In the considered cases, these behaviours are characterized by a similar body posture that involves extension/flexion of the upper limb. In addition, an asymmetrical use of the forearm and shoulder girdle is also noted. Biomechanically, these movements can produce extensor muscle fatigue and lateral epicondylitis at the elbow11. According to iconographic record, hunting is only performed by men.

Discussion

Archery movements are well known and include three-phases: the stance, the drawing and the sighting11. In the considered cases, these behaviours are characterized by a similar body posture that involves extension/flexion of the upper limb. In addition, an asymmetrical use of the forearm and shoulder girdle is also noted. Biomechanically, these movements can produce extensor muscle fatigue and lateral epicondylitis at the elbow11. According to iconographic record, hunting is only performed by men.

Bibliography

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