OC095 - (23825) - MORPHOLOGICAL INVESTIGATION ON THE EVOLUTIONARY ORIGIN OF SHOULDER DISORDERS RELATED TO THE SUBACROMIAL SPACE

E. Eppler (Switzerland)[1]; S. Mathews (Switzerland)[2]; M. Häusler (Switzerland)[2]

1 - Institute of Anatomy, University of Bern; 2 - Institute of Evolutionary Medicine (IEM), University of Zurich

Elisabeth Eppler
Bern

Sandra Mathews
Zurich

Martin Häusler
Zurich

Evolution of bipedalism and the associated reorganization of the shoulder girdle morphology play an important role in anthropology, also with regard to metabolism, child-care, and neurodevelopment. Nevertheless, regarding correlation of the shoulder joint with body size, database is still scarce, particularly for women and smaller individuals. Also, the etiology of shoulder disorders related to the sub-acromial space and lesions of the rotator cuff tendons is often attributed to a relatively narrower sub-acromial space in modern humans, who are reported to have also a relatively smaller supraspinatus muscle.

We present a landmark-based 3D-analysis of the scapular morphology in modern humans (n=89), early hominins (MH2 *Australopithecus sediba* and KNM-WT 15000 *Homo erectus*), extant apes (*Pan troglodytes*, n=44, *Gorilla gorilla*, n=39, *Pongo sp.*, n=20, *Hylobates lar*, n=71) and cercopithecoids (*Papio hamadryas*, n=28).

We found that the supra- and infraspinous fossa areas better reflect the size of the supra- and infraspinatus muscles, respectively, than the commonly used fossa heights. Relative to body size, fossa areas and sub-acromial space were virtually identical in humans and great apes, which matches the proportions of the rotator cuff muscles.

This may suggest that mechanical and anatomical factors might be less relevant for the high prevalence of shoulder disorders related to the sub-acromial space in humans. The study aims at providing a broader database on the evolution of the shoulder girdle as a basis for future research on mechanisms underlying bone and muscle growth in healthy and pathological conditions, with special emphasis on females and smaller individuals.

Palavras-chave : Evolutionary medicine, shoulder girdle, muscoloskeletal diseases