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RADIOFREQUENCY ECHOGRAPHIC MULTI-SPECTROMETRY (REMS) FOR THE RECOGNITION OF MUSCULAR-TISSUE ALTERATIONS

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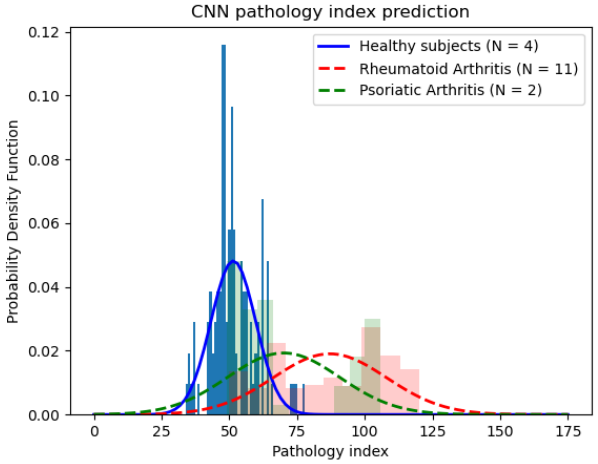
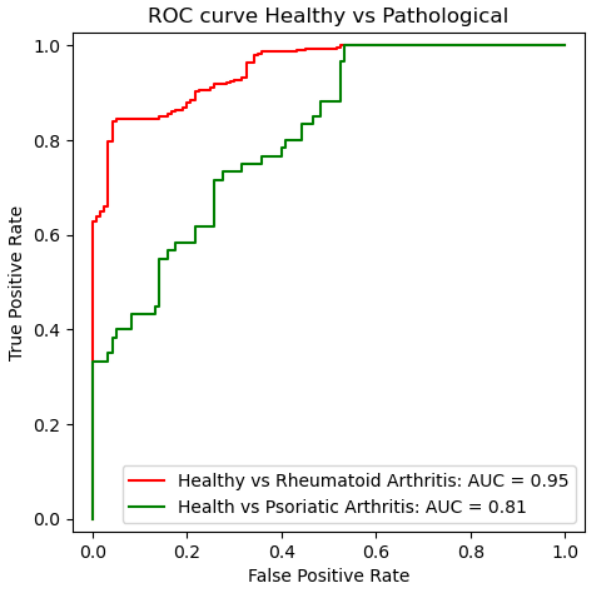
Objective(s): The term “primary sarcopenia” was initially used to characterize the age-related loss of muscle mass in the elderly people. Sarcopenia has since been investigated in many clinical contexts as "secondary sarcopenia", identifying three primary pathogenic mechanisms: inflammatory response (*e.g.* Rheumatoid Arthritis (RA) and Psoriatic Arthritis (PA), et.), malnutrition (*e.g.* malabsorptive conditions, et.), and reduced physical activity (*e.g.* immobility/bed rest, etc.). Nowadays, it's important to note that ultrasound (US) techniques appear to have a strong position in this context. The ability of US to examine numerous aspects of muscle change makes it potentially helpful in the diagnostic work-up of sarcopenia. This study aims to use (Radiofrequency Echographic Multi Spectrometry) REMS technology to assess the pathological changes in muscular-tissue, specifically those of RA and PA subjects respect to healthy controls (HC).

Material and Methods: A total of 17 subjects (4 HC, 11 with RA and 2 with PA) were enrolled and underwent a REMS acquisition of upper limb. The patient was acquired in a supine position with the linear probe placed transversely at the proximal third of the forearm, between the styloid process and the radius head. A novel dedicated Pathology Index (PI) based on the results of a classification algorithm, previously tuned on the REMS data of healthy subjects, was adopted to measure the PI on the HC, RA, and PA patients.

Results: The figure 1 shows the histogram of PI measured for each category of subjects (HC, RA, PA), which appears to be well distinct and separated from each other.



In figure 2 are shown the results in terms of AUC: the algorithm is able to accurately separate images of HC from those with RA and PA, with AUC of 0.95 and AUC of 0.81 respectively for the HC vs PA and HC vs RA comparisons.



Conclusion(s)

REMS is capable to discriminate the images of HC subjects from those with RA and PA. The study demonstrates that REMS technology can provide a dual assessment of muscle and bone health status.