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Neuromuscular electrical stimulation combined with strength training to prevent excessive loss of muscle mass in bariatric subjects

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Obesity is a multifactorial chronic disease, which affects more than 500 million people worldwide and contributes to functional losses, poor quality of life, dementia, type 2 diabetes, and increases mortality rate, mainly due to cardiovascular disorders and cancer. Considering the fail of conservative treatments, bariatric and metabolic surgery are considered the most effective intervention and are among the most commonly performed gastrointestinal procedure in operating rooms today. Although it can reach a record of >50% excess weight loss (EWL), in most cases there are up to 30% fat free mass loss, that could compromise the long term results. The identification of the skeletal muscle as a secretory organ, mostly dependent upon contraction and that can communicate with many organs, brought a new perspective about the importance of muscle mass on the systemic health. The most effective intervention aiming to maintain and gain muscle mass is Strength Training, integrated with consistent modifications in lifestyle. However, the first recommendation for hypertrophy is using loads close to 80% of one repetition maximum (1RM), which can compromise articular integrity, due to a high mechanical load, low grade inflammation, osteoarthritis and sedentary behavior. Subjects must follow an adaptation period that varies according to the individual responses and nutritional intake. But what if we could increase the muscular activation level without raising the load? It is plausible through the combination of Strength Training with Neuromuscular Electrical Stimulation (NMES), that involves the application of an electric current through eletrodes placed over targeted muscle, while the subject does the specific exercise. These combination is safe, and it can potentiates the muscle fiber activation, leading to quicker results in strength, power, maximum voluntary force and possibly increasing the muscle cross sectional area (CSA), as many studies have shown, in different cases, like reconstruction of the anterior cruciate ligament, osteoarthritis, spinal cord injury, patellofemoral dysfunction, low back pain, preoperative total knee arthroplasty, COPD and even in athletes.

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Arterial stiffness is increased in inflammatory bowel disease

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Arterial stiffness is increased with chronic inflammatory disorders. The reduction of inflammation by immunomodulatory therapy is associated with a restoration of arterial function. I have recently reported for the first time that arterial stiffness is increased in subjects with inflammatory bowel disease (IBD). In another work, I have also reported that the increased arterial stiffness detected in IBD subjects is dependent upon inflammation and reduced by anti-TNF-alpha therapy. Subsequently, in an invited review I have discussed on the causes of arterial stiffening in IBD subjects. Consecutively, in an editorial I have discussed on the IBD paradox (subjects with IBD have an increased cardiovascular risk despite the low burden of classic cardiovascular risk factors) and suggested that inflammation may explain the difference between expected and observed risk in IBD. Finally, I have recently published a systematic review and meta-analysis that has confirmed the results of my previous works.

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