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Identification of Inflammatory Biomarkers for the Early Detection of Tendonitis During Repetitive Manual Assembly Tasks: A Proposed Study

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Abstract: Prevalence of musculoskeletal disorders (MSDs) particularly those of the upper body, is increasing in western societies, and are a worldwide major cause of work-related disabilities and injuries in both developed and industrially developing countries. Repetitive tasks with short work cycles involving high-speed arm and hand movements, as well as force-demanding tasks, are well established risk factors for elbow, forearm, wrist and hand disorders. Tendons have a main function as the load-bearing tissues in the musculoskeletal system. Tendinopathy is a progressive inflammatory disease mostly defined by pain and functional loss. After injury, the common inflammatory response produces an influx of white cells, expression of cytokines and metalloproteinases, and swelling. However, tendinopathies may not involve a classic inflammatory response pathway, and rather involve local "molecular" inflammation. This paper reviews current knowledge of tendon mechanobiology, abnormal loading, and injury as a result from degenerative processes secondary to accumulation of micro damage, with the aim at exploring the identification of molecules as biomarkers unique to tendon injury that may enhance the plausibility of early diagnosis and treatment of tendinopathies. An experimental design will be proposed using voluntary subjects exposed to a repetitive manual task and monitoring tenocyte mechanical loading mediators such as CRP, IL-1β, COX-2 and metalloproteinases (MMPs).

Keywords: MSDs, Tendinopathy, Inflammation Biomarkers