Neuroplasticity to comprehend the scientific manifestation of shoulder pain of occupational workers

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The treatment of shoulder pain in overhead activities in an occupational setup has been guided by a structural-pathology paradigm where the source of dysfunctions associated with the injury is found at the site of injury. However, it raises questions like why diagnostic findings do not correlate with pain, why bilateral findings are there with unilateral shoulder injuries, why a great percentage of workers with damage to shoulder muscles are asymptomatic. The present study includes neurophysiological processes and neuroplasticity to comprehend the scientific manifestation of shoulder pain of occupational workers doing repetitive overhead activities. Neuroplasticity permits the nerve cells to compensate for injury and disease and to adjust their activities in response to changes in their environment. More recent studies have demonstrated structural as well as functional changes within the central nervous system (CNS) with chronic musculoskeletal disorders. These changes are initially favourable and help in the healing process by protecting the injured structures from further damage. Therefore, interventions targeting fundamental pathophysiological mechanisms have a much better chance of success in the rehabilitation programs. The present work studies the effects of performing selected rehabilitation exercises while cementing neuroplastic changes by concentrating on the higher planes of consciousness. Electromyographic (EMG) activities of concerning muscles during exercises are measured using surface electrodes (Biopac MP150, Biopac System, CA). Experimentations involve 12 trained subjects who are able to concentrate on planes of higher consciousness during exercises. The results are compared with EMG activities of muscles during same set of exercises in a structural-pathology paradigm. Results support the interventions targeting fundamental pathophysiological mechanisms in the rehabilitation programs.

Speaker Biography

Sanjay Srivastava is affiliated with Industrial Kinesiology Laboratory, Dayalbagh Educational Institute (Deemed University), Dayalbagh, Agra, India. His research interests include Biomedical Engineering, Occupational Health, Consciousness Studies, and Computational Intelligence. His more recent JCR-indexed publications have appeared in WORK: A Journal of Prevention, Assessment & Rehabilitation (IOS Press), International Journal of Occupational Safety and Ergonomics (Taylor & Francis), Journal of Back and Musculoskeletal Rehabilitation (IOS Press), Applied Soft Computing (Elsevier), and International Journal of Computational Intelligence Systems (Atlantic Press). Dr. Srivastava has been on the review board of international conferences, JCR-indexed journals, and book-series. He has carried out an assortment of research projects funded by prestigious agencies of Government of India. He has delivered invited talks and chaired sessions in exalted national and international forums.

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