

FUNCTIONAL INSTABILITY IN PATIENTS AFFECTED BY COLLAGENOPATHIES WITH ARTICULAR HYPERLAXITY

Daniela Platano¹, Giuseppina Mariagrazia Farella², Luca Sangiorgi³, Lisa Berti¹

¹ Alma Mater Studiorum, Università di Bologna, Italy

² IRCCS Rizzoli, Italy

³ IRCCS ISTITUTO ORTOPEDICO RIZZOLI, Italy

e-mail: daniela.platano@unibo.it

Background and Aims

Joint Hypermobility Syndrome (JHS) is an inherited multisystem connective tissue disorder, primarily characterized by excessive joint mobility and widespread musculoskeletal pain, which is the most frequently reported symptom. Neurophysiological impairments are also commonly observed. The combination of joint hypermobility, hypotonia, and reduced proprioceptive acuity renders individuals with JHS more vulnerable to traumatic injuries resulting from joint overuse or mechanical overload. This study aimed to evaluate both static and dynamic postural balance in individuals with JHS by administering postural stability tests.

Methods

Twenty patients from the Rare Diseases Orthopaedic Outpatient Clinic at the Rizzoli Orthopaedic Institute were enrolled in the study. Postural assessments were conducted using the Delos proprioceptive system, analyzing the following parameters: postural instability, Stability Index (SI), and Autonomy Index (AI), under both static and dynamic conditions, with eyes open and closed. The results were compared to those obtained from a control cohort of healthy individuals.

Results

Balance deficits were observed in subjects with Joint Hypermobility Syndrome (JHS), as evidenced by increased postural instability and reduced Stability Index (SI) and Autonomy Index (AI) values when compared to the control group. Subgroup analysis of JHS patients with (i) a history of lower limb pathologies, (ii) a Numerical Rating Scale (NRS) pain score greater than 3, or (iii) localized lower limb pain revealed a statistically significant decrease in SI and AI values under eyes-closed conditions relative to controls. Furthermore, the majority of patients was unable to complete the assessment under dynamic conditions.

Conclusion

Our findings highlight significant balance and proprioceptive deficits in patients with Joint Hypermobility Syndrome (JHS). Specific clinical features were identified as potential indicators of more severe balance impairment, which may serve as discriminative factors to guide targeted rehabilitation strategies to reduce injury risk, improve gait function, and enhance overall quality of life.

Keywords: collagenopathies, hyperlaxity, instability, musculoskeletal disorders