

Scapular Kinematics: A Comparison between Females with and without General Hypermobility Syndrome in Arm Elevation

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Abstract

Objective: Numerous studies showed increasing incidence of acute or recurrent dislocations of the shoulder joint in people with General Hypermobility Syndrome (GHS). Given the critical role of scapular orientation in function of shoulder, the aim of this study is to compare the parameters indicating position and orientation of scapula between females with and without General Hypermobility Syndrome in frontal and sagittal plane in arm elevation.

Materials & Methods: In this cross sectional and case-control study, 16 females with General Hypermobility Syndrome were selected simply and conveniently and 16 healthy females were selected and matched by age, body mass index and menstrual status. A three dimensional motion analysis system (vicon 460) was used to measure scapular position (upper-lower and medial-lateral translations) and orientation (upward rotation, posterior tilt and internal rotation angle). Measurement were taken with the arm placed in different angles of arm elevation. Data analysis was performed with Independent T test.

Results: Upward rotation angles in sagittal plane in 90° ($P=0.03$), 120° ($P=0.01$) and full range of arm elevation ($P=0.04$) were lower in case group as compared to with control group. Also patients with General Hypermobility Syndrome showed a lesser amount of lateral scapular translation in 90° ($P=0.02$) and full range of sagittal plane arm elevation ($P=0.02$). In addition, lateral scapular translation in 120° ($P=0.02$) and full range of frontal plane arm elevation ($P=0.01$) was lower in case group compared with control group.

Conclusion: Altered kinematics in General Hypermobility Syndrome has a great role in shoulder injuries and neuromuscular defect seems to be an underlying cause of scapular kinematics' changes in people with general hypermobility syndrome.

Keywords: Scapula / Three-dimensional kinematics / Shoulder / Biomechanics / Hypermobility

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