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Influence of pelvic kinematics on lower limb rotational deviations during gait

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Keywords: Cerebral palsy; Spastic diplegia; Lower limb rotational deviation; Pelvic kinematics

Introduction.– Lack of normalization of foot progression angle after correction of lower limb torsional troubles raised the question about the influence of pelvic rotation on lower limb rotation during gait. Pelvic rotation abnormalities are difficult to predict by physical examination. The aim of the study was to explore the influence of pelvic kinematics on foot progression angle deviations.

Methods and subjects.– We retrospectively reviewed kinematic data of 188 children with spastic diplegia without any previous surgery. Data, recorded at mid stance phase, were: pelvic rotation, hip rotation, ankle rotation and foot progression angle.

Results.– Abnormal pelvic rotation was noticed in 255 of 376 lower limbs (68%). Among 231 patients with internal foot progression angle, internal pelvic rotation was associated to other transverse plan kinematic deviations in 98 cases (42%). For 78 patients who showed external foot progression angle, external pelvic rotation represented a combined cause in 22 cases (28%).

Discussion.– Pelvic rotation is difficult to analyse by means of observational gait analysis alone. This kinematic parameter can represent an isolated cause of abnormal foot progression angle but it is often combined with other transverse plan deviations. A detailed kinematic analysis of interaction between planes is an essential step when making surgical planning, particularly when foot progression angle has to be corrected.

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Lower limb torsional profile in children with spastic diplegia

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Keywords: Spastic diplegia; Children; Lower limb rotational profile

Introduction.– Lower limbs rotational troubles in spastic diplegic CP children are frequent and difficult to identify by physical examination alone. These troubles modified level arms length and they are important to be treated. The aim of the study was to put in evidence patterns of lower limbs rotational troubles on kinematic data.

Material and methods.– Hundred and eighty-eight spastic diplegic CP children, without any previous surgical procedure, were retrospectively reviewed. Kinematic data analysed pelvic, hip and ankle rotation with foot progression angle.