(SOL), tibialis anterior (TA), vastus lateralis (VL), rectus femoris (RF) and hamstrings (HA) and were compared between lower limbs according to the degree of induce equinus. The data were divided into nine intervals in relation to the phases of the motion as described by Perry.

Results.– On the lower limb with the orthosis, the activation of the SOL was earlier from 73–100% and 0–50% of the cycle (coactivation SOL-TA) and the amplitude increase from -10° of dorsiflexion ($P < 0.01$). From 0 to 10% of cycle, the TA amplitude decreases from -20° ($P < 0.01$). From -10° of dorsiflexion, the HA activation significantly increase from 0 to 10% of the cycle. The DA activation decrease from 0–10% cycle ($P < 0.05$) and like the VL, a muscular activation appear in the middle of stance phase -20° (VL 20–30%: $P < 0.05$). The contralateral limb, SOL activated earlier from 87–100% and 0–10% at MP ($P < 0.01$).

Discussion.– Equinus gait secondary to the orthosis induced changes in muscle activation both in terms of timing and in terms of signal amplitude. The premature activity of SOL, the TA-SOL coactivation and the reduce TA amplitude are frequently observed during cerebral palsy gait. These findings in healthy children show that a foot deformation without neurological disturbance induce primary changes in muscle activation, which must be taken into account during interpretation in motion analysis.

Further reading

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Peroneus longus and the midfoot in children: EMG normative data

C. Boulay *, V. Pomero, M. Jacquemier, G. Authier, E. Castanier, Y. Glard, G. Bollini, B. Chabrol, J.-L. Jouve, E. Viehweger
Plate forme d'analyse de la motricité, pôle médico-chirurgical pédiatrique, CHU Timone-Enfants, 264, rue Saint-Pierre, 13385 Marseille, France
**Corresponding author.*
E-mail address: christophe.boulay@ap-hm.fr.

Keywords: Mid foot; Children; Peroneus longus; Dynamic EMG; Gait

Introduction.– The EMG overactivity of peroneus longus (PL) is described [1] as the major deforming force in spastic midfoot break in adult after stroke. Before to test this hypothesis in children with cerebral palsy (CP), it was necessary to provide the normal EMG activity of PL in children without neuromuscular disorders. These data are not studied in literature. It was necessary to provide the normal EMG activity of PL [2] in children without neuromuscular disorders before to study its overactivity in CP especially in the midfoot break.

Materials and methods.– One thousand one hundred and four strides of 21 children (age 6.5yrs ± 1) without neuromuscular disorders were examined using surface EMG during walking. The PL activity was normalized as a percentage during strides. A software selected the more repeatable strides. The onset, offset activity of rectified raw EMG signal was detected by a manual selection: the threshold was 20 μV [3].

Results.– Resulting in 1104 normal strides: the mean toe off was at 62.8%, the PL onset activity was at 26.8% in midstance and the offset at 52.2% during terminal stance. There was never activity during swing phase.

Discussion.– These data confirmed the PL activation as a locking effect on midfoot, in midstance during the ankle rocker for progression and without motor action on the ankle [4]: PL supports the longitudinal and transversal arches. In terminal stance during forefoot rocker for progression, PL has a locking effect on the first ray: the forefoot is stabilising during the heel rise. It prevents excessive inversion thus maintaining the first metatarsal down on the ground. PL maintains the stabilisation of the first and second ray by a pronation to counteract the lift effect of the supination muscles. The PL contraction should be rather isometric.

Conclusion.– PL EMG activation provides, during mid stance, a locking effect on the midfoot and in terminal stance a stabilising effect on the forefoot after heel rise [2]. Thus the relation between PL overactivity and midfoot break has to be assessed in CP children.

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Impairment profile of shoulder muscle strength in children with brachial plexus palsy at birth

S. Brochard *, L. Curatalo, F. Sheehan, K. Alter, D. Damiano
Functional and Applied Biomechanics Section, Rehabilitation Medicine Department, Clinical Center, National Institutes of Health, 10 Center drive, 20892 Bethesda, United States
**Corresponding author.*
E-mail address: sylvain.brochard@chu-brest.fr.

Keywords: Brachial plexus palsy; Shoulder; Strength; Children

Introduction.– Brachial plexus palsy (BPP) at birth can lead to severe functional limitations of the whole upper-limb. Although shoulder muscle strength loss and imbalance are central to the loss of upper-limb function associated with BPP, biomechanical and clinical assessments of muscle strength are rarely reported for this population. Thus, the aim of this study was to quantitatively evaluate the muscle strength impairment profile in a group of children with unilateral BPP. In addition, the validity and reliability of the current methodologies was tested.

Methods.– Ten children with unilateral BPP (mean age = 12.31, SD = 3.28) underwent the following assessments in both shoulders: (1) three trials of maximal isometric contractions in flexion/extension, internal/external rotation, and abd/adduction using a hand held dynamometer, (2) maximal isometric contractions of flexion/extension using a Biodex®. The maximal values of the involved shoulder were compared to the non-involved one.

Results.– The concurrent validity between the hand held dynamometer and Biodex® measures was excellent ($r^2 = 0.81$). The inter-trial reliability was also excellent (ICC between 0.94 and 0.98), regardless of the direction and side. The comparison between sides showed significant differences in all directions (*P*-values ranged from 0.036–0.0009), except for flexion. External rotation and extension were the most impaired directions, with average strength impaired/non impaired shoulder ratios of 30% and 40%.

Discussion.– This study provides the first comprehensive quantitative measurement of shoulder muscle strength using a hand held and motorized dynamometer in children with BPP. Future work will relate specific patterns of weakness to resultant bony and muscle deformity and functional limitations.

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T-score computer-calculation in Goal Attainment Scales does not provide further information than hand-calculation of simple mean scores: Analysis of 537 GAS scales

A. Krasny-Pacini [a,*], J. Hiebel [a,b], S. Godon [a], F. Pauly [a,c]
[a] *CHU de Strasbourg, 1, rue de l'Église, 67600 Ebersheim, France*
[b] *CRF Clémenceau, Strasbourg, France*
[c] *CHU Luxembourg, Luxembourg, France*
**Corresponding author.*
E-mail address: agatakrasny@yahoo.com.

Keywords: GAS; Personal goals; Scale; Botulinum toxin

Goal Attainment Scaling (GAS) is a method of measuring progress towards individual goals. GAS is originally a 5-points scale, that represent baseline and different levels of goal attainment. It is possible to calculate by an Excel calculation sheet a T-score that gives the overall result of the different scales of one patient using Kiresuk's forumulae. The aim of this study was to compare T-scores and simple means of GAS raw scores.

For 2 years all patients, aged 2–20 presenting a motor handicap that needed botulinum toxin treatment were included. One to seven GAS scales were written per patients and results were assessed 8 weeks after treatment. T-scores were