Similarly, a significantly higher proportion of patients demonstrated
– Dysport® 500 and 1000 U improved muscle tone and function,
observed.

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Background. – This study assessed the efficacy of Abobotulinumtoxin A (Dysport®) on upper limb spasticity (ULS) and function in hemiparetic adults following stroke/traumatic brain injury.

Methods. – Phase III, prospective, double-blind, placebo-controlled study; 243 patients (from 34 sites in 9 countries) were randomized (1:1:1) to Dysport® 500 or 1000 units (U) or placebo.

Primary objective. – To assess the efficacy of Dysport® in reducing upper limb muscle tone (using MAS) in patients’ primary targeted muscle group (finger, wrist or elbow flexors). Secondary objectives. – Clinical benefit, assessed by Physician Global Assessment (PGA), and improvement in passive function, assessed by the Disability Assessment Scale (DAS).

Results. – A significantly higher proportion of patients compared to placebo were responders:
– ≥ 1 point improvement in MAS as early as 1 week and 4 and 12 weeks post-injection with either dose of Dysport®;
– significant clinical benefit, according to PGA scale, was also observed. Similarly, a significantly higher proportion of patients demonstrated ≥ 1 grade improvement in DAS at week 4 and 12 with 1000 U. No new safety events were observed.

Conclusions. – Dysport® 500 and 1000 U improved muscle tone and function, and provided clinical benefit in adults with ULS. Safety profile was consistent with the known profile of Dysport® in this indication.

http://dx.doi.org/10.1016/j.rehab.2014.03.156

CO36-007-e
Muscle structure assessment after botulinum neurotoxin A injection. Literature review
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Keywords: Spastic muscle; Botulinum neurotoxin; Atrophy; Stiffness; Literature review

Background. – Botulinum neurotoxin A manages spasticity disorders in neurological central diseases. But this treatment may induce muscular modifications.

Methods. – We made a literature review in order to explore the structural and passive biomechanical properties of the musculotendinous unit after injections in healthy animal muscles and in spastic human muscles, as well as the methods of evaluation of these properties.

Results. – Twenty articles have been selected. Histological analyses have been carried out especially on animals. A neurogenic atrophy systemically occurs. In humans, one year after a single injection, the histological recovery is incomplete. The passive biomechanical analysis of muscle stiffness shows on the short term, a modulus elastic increase in animals whereas no change is recorded in humans. 2D US analysis shows gastrocnemius thickness and pennation angle reduce. MRI volumetry analysis shows muscle atrophy, six months or one year after a single injection. Sonoelastometry analysis shows, on the short term, a modulus elastic decrease.

Conclusions. – Very little data exists. The muscle changes need to be taken into account when seeking functional improvement. The protocols are inconsistent. 2D US and Sonoelastometry should be developed in long term monitoring.

http://dx.doi.org/10.1016/j.rehab.2014.03.157

CO41-003-e
Central effects of botulinum neurotoxin A:
Spinal plasticity in stroke patients after injection in ankle plantarflexors
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Keywords: Botulinum neurotoxin A; Reciprocal inhibition; Stroke Background. – BoNT-A depresses recurrent inhibition of lumbar motoneurons likely due to its retrograde transportation. Because Renshaw cells control group Ia interneurons mediating reciprocal inhibition between antagonists, we tested whether this inhibition particularly affected after stroke could recover after BoNT-A.

Methods. – Effect of posterior tibial nerve stimulation (PTN) on tibialis anterior electromyogram was investigated in 13 stroke patients during treadmill walking before and 1 month after BoNT-A injection.

Results. – After injection, the PTN induced reciprocal facilitation in la motoneurons during all the swing phase was depressed at the beginning of swing and reversed into inhibition in midswing.

http://dx.doi.org/10.1016/j.rehab.2014.03.157
Conclusions.—This suggests that BoNT-A induces spinal plasticity leading to the recovery of reciprocal inhibition, which is likely to be due to the withdrawal of inhibitory control from Renshaw cells directly blocked by BoNT-A. This could help in limiting ankle muscle co-contractions in the transition phase from stance to swing, to assist dorsiflexion.

Further readings

CO41-004-e
Central effects of botulinum toxin: Neurophysiological study in post-stroke patients with lower limb spasticity
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Background.—The therapeutic effects of intramuscular injections of botulinum toxin type A (BTX) on spasticity can be largely explained by its blocking action at the neuromuscular junction. BTX is assumed to also have a central action by affecting the functional organization of the CNS. The aim of the present study is to assess the action of BTX on spinal motor networks by investigating the post-activation depression (post-AD) of the soleus H-reflex in post-stroke patients presenting lower limb spasticity.

Methods.—Soleus H-reflex was investigated in chronic hemiplegic patients before and 3, 6, 12 weeks after BTX-injections in soleus. H-reflex amplitude was analyzed in response to electrical stimulation of the tibial nerve at 0.1 Hz and 0.5 Hz. Post-AD was quantified as the ratio H0.5Hz/H0.1Hz.

Results.—The post-AD was significantly reduced in the affected side compared to the non-affected side before BTX injection. Three weeks after injection, the post-AD was reinforced in the paretic leg and significantly higher than in the AL group. (IL, 7 ± 3°; AL, 15 ± 4°, P = 0.04; hamstrings, IL, 19 ± 4° vs AL, 42 ± 7°, P = 0.02) and smaller angle of weakness across all muscles studied (P = 0.04, Wilcoxon). A was strongly correlated with Xv2 across all muscles in the IL group (P < 0.05) while this was only true for plantar flexors and gluteus maximus in the AL group.

Conclusions.—Passive mechanical obstacles have greater impact on motor deficiences in infant paresis than in adult acquired lesions.

http://dx.doi.org/10.1016/j.rehab.2014.03.161

CO41-005-e
Passive mechanical obstacles vs impairment of neurological command in infant vs adult-acquired spastic paresis
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Background.—Compare muscle length, spasticity angle and active range of motion in adult paretic syndromes due to lesions acquired in infancy vs adult-acquired lesions.

Methods.—Cross sectional study from a retrospective chart review.

Population.—Convenience sample of 2 groups of clinic patients with spastic paresis due to an infant lesion (IL, n = 11) or to an adult-acquired lesion (AL, n = 11).

Evaluation.—Muscle length (Xv1), angle of catch (Xv1), spasticity angle (Xv = Xv1–Xv1), active range of motion (A) and angle of weakness (Xv1–A) in soleus, gastrocnemius, gluteus maximus, hamstrings, vastus and rectus femoris muscles at the initial evaluation (pre-toxin).

Results.—The IL group had shorter muscle lengths in gluteus maximus (Xv1, IL, 101 ± 5; AL, 120 ± 5°, P = 0.02, Mann–Whitney) and hamstrings (Xv1, IL, 31 ± 7°; AL, 63 ± 5°, P = 0.004), smaller spasticity angles (X, gluteus maximus, IL, 7 ± 3°; AL, 15 ± 4°, P = 0.04; hamstrings, IL, 19 ± 4° vs AL, 42 ± 7°, P = 0.02) and smaller angle of weakness across all muscles studied (P = 0.04, Wilcoxon). A was strongly correlated with Xv2 across all muscles in the IL group (P < 0.05) while this was only true for plantar flexors and gluteus maximus in the AL group.

Conclusions.—Passive mechanical obstacles have greater impact on motor deficiences in infant paresis than in adult acquired lesions.

http://dx.doi.org/10.1016/j.rehab.2014.03.162

P202-e
Safety profile of 400 U onabotulinumtoxinA for the treatment of upper limb spasticity
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Keywords: Botulinum toxin; Safety

Background.—The safety profile of onabotulinumtoxinA for treatment of upper limb spasticity (ULS) was assessed across a range of doses to evaluate treatment with ≥400U.

Methods.—Integrated data from 18 studies of onabotulinumtoxinA for ULS were evaluated by 4 dose groups (< 150 U, 150–250 U, 251–399 U, ≥ 400 U). Treatment exposure, incidence of adverse events (AEs), serious AEs, and possible distant spread of toxin (PDSOT) were assessed, together with the safety profile of patients who received 4 consecutive onabotulinumtoxinA ≥400 U treatments.

Results.—Over all, 1342 patients received ≥1 onabotulinumtoxinA treatment; 183 received ≥400 U, with 6.6% (88/1330), 12.3% (115/936), 23.3% (113/486), and 31.2% (96/308) in treatment cycles 1–4, respectively. AE rates were similar across dose groups, with no consistent increase in incidence of any individual AE/serious AE and no evidence of PDSOT at doses ≥400 U across treatment cycles. The overall AE rate among the subset of patients (n = 51) with 4 consecutive ≥400 U treatments was similar (43.1%, 43.1%, 43.1%, 41.2%), with no overall change in profile for AEs/serious AEs with increasing treatments.

Conclusions.—OnabotulinumtoxinA at doses ≥400 U was well tolerated in ULS patients, with no consistent pattern of increase in AEs at doses ≥400 U, reported systemic AEs, or change in safety profile over consecutive treatments.

http://dx.doi.org/10.1016/j.rehab.2014.03.162

P203-e
Interests of medical hypnosis during toxin botulinic injections: Preliminary study
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Keywords: Toxin; Spasticity; Hypnosis; Pain

Background.—Our study concerns the efficiency of hypnosis during the injections of botulinum toxin. Hypnosis is widely used in medicine to decrease the anxiety and the painful felt, but few publications are appeared in physical medicine and rehabilitation.

Methods.—In this bi-centrique study, the injections are practised at 30 patient’s spastics. Two groups are constituted: the group “hypnosis” (standards analge-