POSTSTROKE UPPER LIMB SPASTICITY TREATMENT INCLUDING BOTULINUM TOXIN IN AN INPATIENT POST-ACUTE REHABILITATION PROGRAM: HOW ARE WE DOING IT?

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INTRODUCTION

Stroke is one of the leading causes of mortality and disability in all industrialized countries. After completing rehabilitation almost 50% of stroke survivors remain at least partially dependent. Post-stroke spasticity can appear in an early phase and may impose a worse functional outcome as it can cause symptoms as pain and involuntary movements, make care and hygiene more difficult and limit activities of daily living and mobility. Upper limb botulinum toxin injections are a worldly accepted treatment for focal/regional post-stroke spasticity and are routinely applied in our inpatient and outpatient spasticity clinic.

OBJECTIVES

The aim of this study was to describe the use of upper limb botulinum toxin injections (UL-BoNTA) to treat limitations or symptoms due to post-stroke spasticity during a post-acute inpatient rehabilitation program.

MATERIAL AND METHODS

Data were prospectively collected during the inpatient rehabilitation program. Out of all stroke inpatients treated from 2011 to 2016 we identified 41 whose multidisciplinary rehabilitation program included Botulinum Toxin treatment exclusively for the upper limb.

The primary goals for UL-BoNTA treatments were classified based on the document Goal Attainment Scaling – Evaluation of Outcomes for Upper Limb Spasticity Tool (GAS-eous tool).

The injected muscles and BoNTA doses are also described and commented.

RESULTS

Mean age was 64.2 years, and 51% were females. The most frequent etiology was ischemic (78%). Impairment was left hemiparesis in 42% and right hemiparesis in 51% of cases. Mean stroke-to-admission interval was 107 days. Mean FIM at admission was 72/126 and 91/126 at discharge, with an average functional improvement of 19/126.

	UL-BoNTA
	N=41
Mean age (years)	64,2 (SD12,6)
Gender	
Male	48,8%
Female	51,2%
Etiology	
Ischemic	0,8
Length of stay	69 days
Stroke localization	
Right hemisphere	36,6%
Left hemisphere	53,7%
Subhemispheric	4,9%
Mean stroke- to- admission interval	107 days
Upper limb BoNTA injections	41 patients
Mean admission FIM (average)	72
Mean discharge FIM (average)	91
Mean FIM change(average)	19

FIG 1: Patients characteristic's

Of 41 patients, 24 had SMART goals properly described, 20 of which had UL-BoNTA for goals related to the Impairment / Symptoms domain - D1 (15 pain/discomfort, 4 involuntary movements, 1 range of motion) and the other 4 related to the Activities / Function domain – D2 (2 mobility, 1 passive function, 1 active function).

Primary Goals Domains and Areas	N
D1- Impairment/Symptons	**20**
Pain/disconfort	15
Involuntary movements	4
Range of motion/prevent. of contractures	1
D2- Activities/Function	**4**
Passive function	1
Active function	1
Mobility	2

FIG 2: Primary goals domains and areas

The most frequently injected muscles were in the shoulder and arm: biceps brachii / brachialis anterior / brachioradialis (34/41), subscapularis (22/41), pectoralis major (20/41), followed by forearm flexors (flexor carpi radialis 17/41, flexor carpi ulnaris 16/41, and flexor digitorum superficialis 14/41).

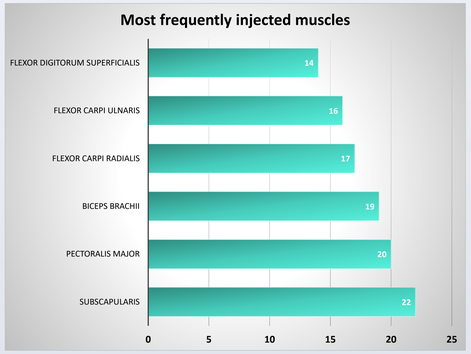

FIG 3: Number of injections in the most frequently injected muscles

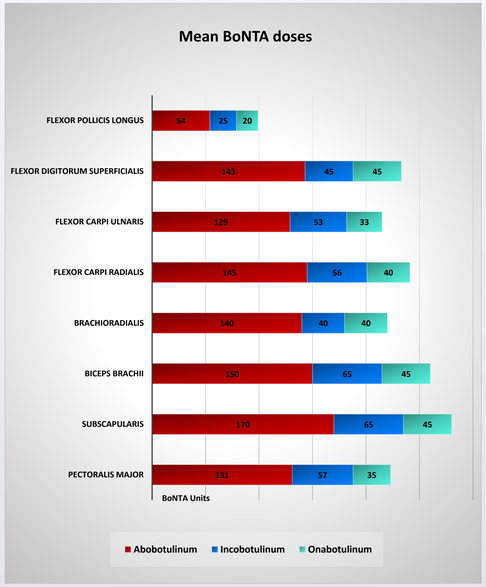

FIG 4: Mean BoNTA doses for individual muscles for the three BoNTA formulations used

The mean BoNTA doses injected into each muscle in the three different BoNTA formulations, according to clinical non interventional judgement only in our everyday clinic are described in figure 4.

The dose proportion between the 3 BoNTA preparations that we routinely use (abobotulinumtoxin A / incobotulinumtoxin A / onabotulinumtoxin A) were the following per muscle: subscapularis 1/0.38/0.26; pectoralis major 1/0.44/0.27; biceps brachii 1/0.43/0.30; flexor carpi radialis 1/0.39/0.28; flexor carpi ulnaris 1/0.41/0.26; flexor digitorum superficialis 1/0.31/0.31, and flexor pollicis longus 1/0.46/0.37. Units as per brand, and non convertible.

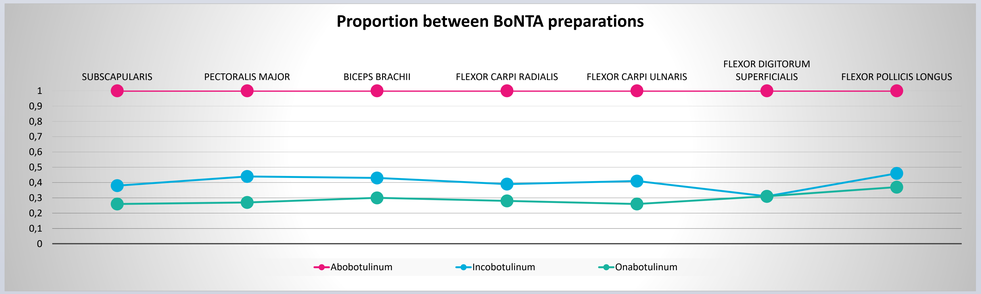

FIG 5: Proportion of the mean BoNTA doses for individual muscles

CONCLUSIONS

We found that, in our practice, the most frequent treatment goals for upper limb spasticity with BoNTA in post-acute, post-stroke spasticity, in an inpatient multidisciplinary clinical setting, were related to pain/discomfort and impairment.

This is not too surprising, taking into consideration that these were post-acute care inpatients, so their real life is focused on and partly limited by the hospital environment and their therapeutic activities.

On the other hand we confirmed our suspicion that in real-life routine clinical practice, experienced clinicians do not use a fixed conversion rate between any of the 3 available formulations of BoNTA. In fact, we observed that different muscles were treated with different dose proportions, when we looked into this a posteriori.

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