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Profile of patients undergoing therapy using botulinum toxin within the late neurorehabilitation of adult post-stroke patients

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Abstract

BACKGROUND: Scientists and clinicians still look for satisfactory treatment for post-stroke spasticity, especially within long-term neurorehabilitation. Relatively novel therapeutic method is use of botulinum toxin type A (BTX-A).

OBJECTIVE: Contrary to the previous studies we focused on late post-stroke population. This study aims at showing such patients profiles.

CASE STUDIES PRESENTATION: We describe a convenience sample cases study analysis of six adult patients with post-stroke spasticity (mean time after cerebrovascular accident: 7.5 years) admitted to the neurological rehabilitation ward.

CONCLUSIONS: Despite BTX-A is one of the most potent antispastic medications details of its optimal application and effectiveness within long-term neurorehabilitation of adults are still in the process of being confirmed. Current health status, secondary changes and complications, individual therapeutic goals and functional skills expected to achieve in particular case may significantly modify way of the therapy.

Introduction

Spasticity significantly influences short-, medium- or long-term therapy outcomes in post-stroke patients. Scientists and clinicians still look for satisfactory treatment for post-stroke spasticity treatment. Relatively novel therapeutic method is use of botulinum toxin type A (BTX-A). It may improve functional mobility targeted muscle groups (allowing for further use e.g. kinesiotherapy), but requires individually selected doses. Pain, if present, seems do not influence outcome of the therapy. There is need strict regimen, but offers safe and reversible therapeutic option. Most studies showed efficacy of BTX-A and physiotherapy in early post-stroke population [1]. Despite effort of scientists evidences for the effectiveness of multidisciplinary rehabilitation programmes following BTX-A injection are still weak and unclear [2].

The study was conducted in accordance with the and the Helsinki Declaration and the rules of Good Clinical Practice. Written informed consent was obtained from each patient before the study.

Contrary to the previous studies we focused on late post-stroke population. This study aims at explaining criterias of inclusion such patients.

Case studies presentation

A study design is convenience sample cases study analysis of six adult patients with upper limb post-stroke spasticity (females=50%, mean age 52.5, mean time after cerebrovascular accident (CVA): 7.5 years) admitted to the neurological rehabilitation ward. Age \geq 18 y.o., spastic upper limbs muscles, fail of the previous therapies, lack of contraindications to BTX-A therapy, and planned physiotherapy direct after injection were initial inclusion criteria.

Table 1. Patients' overall profile.

No of patient	Short description of the spastic upper limb	Clinical outcomes at admission				
		MMSE	AS	MAS	MRC	CGI-I
1	Unnatural spastic upper limb position both during rest and during attempts to move. Pain. Lack of coordination spastic hand – whole body. Abilities to use spastic hand in activities of daily living.. Ability to grasp.	norm	3	3	4	3
2		norm	3	3	3	3
3		norm	3	3	3	3
4		norm	4	4	3	3
5		norm	4	4	3	3
6		norm	3	3	3	3

Abbreviations: AS- Ashworth Scale, MAS- Modified Ashworth Scale, MRC -Medical Research Council Scale for Muscle Strength, CGI-I - Clinical Global Impression – Global Improvement Scale, MMSE - Mini-Mental State Examination.

Clinical outcomes of MMSE in all patients was norm. Mean values of clinical scores and scales were as follows:

- AS: 3.33,
- MAS: 3.33,
- MRC: 3.17,
- CGI-I: 3.0.

Discussion

Observed incidence of spasticity is variable (4.0-42.6%). It may depend e.g. lesion location, time after CVA, and received therapy and care [3, 4, 5, 6, 7]. Post-stroke spasticity seems to be well defined and studied but it is not completely understood so far.

Current antispastic medications are unsatisfactory for spasticity treatment. Botulinum toxin type A (BTX-A) shows promise as a new therapeutic option.

In relatively early phase of the post-stroke rehabilitation injection of BTX-A decreases spasticity of the injected muscles. Mean gain is about 1 point on the AS/MAS in the 4-6 weeks post injection, but variability in the aforementioned area is large [8]. We do not know exactly how late beginning of the neurorehabilitation using BTX-A may influence functional outcomes. It seems complication of such cases may cause outcomes worse compared with earlier neurorehabilitation. Sometimes improvement is hard to detect or assess using traditional clinimetric tools (e.g. Modified Ashworth Scale, etc.) [9]. High level of spasticity, severity of motor deficits before injection, and lack of progress in rehabilitation despite wide spectrum of used therapeutic means mostly explained use of BTX-A. Secondary outcomes include measures of symptoms, impairments, participation, quality of life (QoL), impact on caregivers and lack of possible contraindications and adverse events. Essential is assessment of functional status and activities possible with spasticity.

There may be true an assumption that profile of patients undergoing neurorehabilitation late after CVA (mean=7.5 years) may significantly differ from patients undergoing rehabilitation earlier (up to 12 months after CVA) [10]. Various history of long-term post-stroke rehabilitation, stroke-related complications, previous attempts to improve functional status of patients, and decreased motivation of patients and their families/caregivers make presented group challenge for every multidisciplinary therapeutic team. Age of patients (mean=52.5 years) is similar to many studies concerning use of BTX-A in early post-stroke rehabilitation [10].

Aforementioned limitations of previous studies make results of the late post-stroke rehabilitation only partially predictable or even non-predictable at all. Even results of BTX-A use in patients during short-term poststroke neurorehabilitation are wide discussed [11, 12].

Conclusions

Despite BTX-A is one of the most potent antispastic medications details of its optimal application and effectiveness within long-term neurorehabilitation of adults are still in the process of being confirmed. Time after CVA, current health status, secondary changes and complications, individual therapeutic goals and functional skills expected to achieve in particular case may significantly modify way of the therapy. Every effort toward new effective way of intervention is precious. Achievement of the therapeutical success still constitutes true challenge.

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