

Botulinum Toxin Type A in the Treatment of Spasmodic Torticollis 86 Cases

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There were 86 cases in-patient and out-patient of spasmodic torticollis, ST recorded in our department from April 1996 to June 2001. Local injection of Botulinum Toxin Type A was used in the treatment, now reported as follow.

Material and Method

1. Clinical Information

There were 86 cases in this study, 39 cases were male and 47 cases were female, aged from 10~76, averaged age 48. Turning type 38 cases, side-tipping 24 cases, hypsokinesis type 10 cases, procurvation type 5 cases, mix 9 cases. Thirteen cases complicated with tremor. Durations were form 3 months to 23 years, average 4 years. All of them had taken multi medical, acupuncture and moxibustion, latch-up, bee-therapy, physiotherapy etc treatments. Thirty five cases were become more serious after taken treatment of acupuncture and moxibustion, and then terminated the treatment under their self-decision. Sixty-eight cases had taken medical treatment, due to the side effect from the treatment, they gave up the treatment or discontinuously administrated. Two cases had taken surgery treatment, but it were re-attacked 1~2 year(s) after treatment. Three cases complicated with psychosis, they had taken antipsychotic drug before treatment.

2. Method

Eighty-six case patients were took neck vertebrae x-ray film, in order to eliminate any case of osteoarthropathical induced neck vertebrae malformation torticollis. Eighty-six cases were took EMG inspection, to find out the position of spasmodic muscle group and understand the spasmodic acuity. Twenty-six cases were took electrocardiograph inspection before treatment, 4 cases were re-inspected after treatment. Eight cases were conducted skull CT. Eighty-six cases after diagnosis, were treated with China made botulinum toxin type A. This medicine was a white lyophilized crystalline powder, stored at freezer, containing 100U or 55U per vial, it was reconstituted to 25U per milliliter by normal saline before treatment, and should be used within 0.5 hour once reconstituted, bubble should be avoided during reconstitution. According to EMG targeted spasm muscle group positioning, gentian

violet was used for pointing, and then fixed by iodine. Injection dosage and deepness were according to size, length, thickness and spasmodic acuity of the spasm muscle, anatomic site was different for different people. The first-time injection dosage was 100~200U, then return-visit and supplementary injection after every 10 days, total dosage for every supplementary injection should not more than 100U. The supplementary injection site would be adjusted according to the condition, spasmodic acuity and muscular contraction mechanics principle. Sixty-eight cases injected for 5 times. Seven cases injected 6 times, 8 cases with 7 times, 2 cases with 8 times, 1 case with 10 times. All the cases after treatment, were conducted message rehabilitation treatment by physiotherapist, until the torticollis was reformed. Patients were follow-up via re-visit, photo taking, telephone-visit and mailing 3 months, 6 months, 1 year, 3 years and 5 years after treatment.

3. Treatment Evaluation

Grading was according to Tsui scale^[1]: $T = [(R+L+E) \times DS] + (U \times Du)$. Where R: degree of rotation (0 for no rotation, 2 for $<15^\circ \sim 30^\circ$, 3 for $>30^\circ$); L: gradient (0 for no slant, 1 for slight level was 1, 2 for medium level, 3 for serious level); E: shouter lift-up or abatement (0 for no change, 1 for slight level, 2 for serious level); U: discontinuously action, e.g. tremor, pumping (0 for no tremor, 1 for tremor appeared); Ds and Du were representing the degree of strain of continuously and discontinuously action respectively (1 for discontinuously, 2 for continuously). $\Delta T = T$ before treatment - T after treatment, $\Delta T \geq 4$ was defined as significantly effected, $\Delta T \geq 8$ obviously improved.

Result

Eighty-six cases in this study were effected, 84 cases were effected significantly (97%), 2 cases were relief obviously (3%). Tsui scale grading was decreased from (14.4 ± 3.6) before treatment to (3.4 ± 1.8) after treatment. After checked the differences, it showed a significant meaning ($t = 3.88$, $P = 0.01$); it was effectuated 8~10 days after injection, achieved the best effect at 30~50days, lasted for 1~5 year(s). In this study, 1 of the 3 cases complicated with psychosis was effected significantly, 2 cases were obviously relief, 2 cases of post surgery treatment re-attacked case were effected significantly; in this study, there were 4 cases re-attacked after treatment, the symptoms were better than before treatment, among them 2 cases were treated for 5 times, total dosage of each case was 500U; one case was treated for 6 times with total dosage 600U, one case was treated for 7 times with total dosage 700U, it was effected as well as first time treatment after re-injected for 1~2 time(s). Four cases did not re-attack during the first 1~2 year(s) re-visit. Clinical selected muscle (group), and

injection dosage and number of points of each muscle (group) of the 86 cases in this study were summarized in Table 1 and 2.

In this study, there was 1 case attacked by myocardial ischemia that has no myocardial ischemia history, after 3 times injection appeared cardiopalmus and chest distress, electrocardiogram indicated large area myocardial ischemia. It was relief after applied percutaneous transluminal coronary angioplasty and nutritive myocardial medical treatment for 1 month, electrocardiogram being normal. After treated with botulinum toxin type A for twice, total 200U, the above symptoms were appeared again; electrocardiogram indicated large area myocardial ischemia. After treated with the above treatment for 1 month, the symptoms were relief, electrocardiogram returned to normal again. Sixty-seven cases had local pain after injection, 18 cases felt hard of the injection site, 74 cases showed weakness of neck, 5 cases were infatuated, the above side effects have not treat with any special treatment, it were disappeared after observed for 1~2 month(s).

Table 1 Selected muscle (group) of patients

Type	Case(s)	Selected muscle (group)
Turning	38	Sternocleidomastoid muscle (offside), muscle splenius capitis (abaxial), semispinalis capitis muscle (abaxial), trapezious muscle (abaxial), middle and back scalene muscle (abaxial)
Side-tipping	24	Sternocleidomastoid muscle (offside), muscle splenius capitis (abaxial), semispinalis capitis muscle (abaxial), trapezious muscle (abaxial), front, middle and back scalene muscle (abaxial)
Hypsokinesis	10	Muscle splenius capitis (bilateral), semispinalis caitis muscle (bilateral), trapezious muscle (bilateral), back scalene muscle (bilateral), levator scapulae muscle (bilateral)
Procurvation	5	Sternocleidomastoid muscle (bilateral), trapezious muscle (bilateral), front and middle scalene muscle (abaxial)
Mix	9	Sternocleidomastoid muscle (offside), muscle splenius capitis (bilateral or abaxial), middle and back scalene muscle (bilateral or abaxial), sacrospinal muscle (bilateral or abaxial)

Table 2 Injection dosage and number of points of muscle (group)

Name of muscle (group)	One-side injection dosage (U)	Number of points
Sternocleidomastoid muscle	15 ~ 25	10
Muscle splenius capitis	15 ~ 30	8
Semispinalis capitis muscle	15 ~ 30	6
Trapezius muscle	15 ~ 30	8
Front scalene muscle	10 ~ 15	4
Middle scalene muscle	15 ~ 20	6
Back scalene muscle	10 ~ 15	4
Levator scapulae muscle	25 ~ 30	6
Sacrospinal muscle	15 ~ 25	6

Discussion

The mechanism of botulinum toxin type A in the treatment of dystonia disease is clear, it inhibited the release of acetylcholine at presynaptic membrane, relax and paralysis muscle^[2], relief of muscular spasm, relief of symptom. Foreign electrophysiological studies proof that botulinum toxin type A plays a double-effect in afferent fibers and efferent Motoneurons^[3].

In this 86 cases study, 84 cases (97%) were significantly affected, 2 cases (3%) were obviously relief. There was an obviously drop in Tsui scale grading. The effective percentage of foreign reported botulinum toxin type A in the treatment of spasmodic torticollis was 61% ~ 93%, average duration was 14 weeks^[4, 5]. The effective percentage of this study was evidently higher than the foreign reported, the relief was long lasting for 1 ~ 5 year(s), low re-attack rate. It might relate to the improvement of treatment method and the increase of treatment dosage. It might also relate to the additional message rehabilitation treatment.

Botulinum toxin type A is safe and effective in the treatment of spasmodic torticollis, easy handle; it is a new and the first-choice treatment for this disease in nowadays.

Reference

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