A Clinical Study of Botulinum Toxin Type A in Treatment of Facial Spasm and Focal Dystonia

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Abstract

Botulinum Toxin Type A in treatment of hemifacial spasm and focal dystonia obtained very satisfactory effect without general reaction. Its local side effects were slight and reversible. Average duration of effect of hemifacial spasm was 8 – 28 weeks (average 12.8 weeks), that of spasmodic torticollis was 7 – 24 weeks (average 11.4 weeks), that of Meige's Syndrome was 4 – 10 weeks (average 6 weeks), that of writer's cramp was 6 – 12 weeks (average 8 weeks), that of multiple sclerosis was 7 – 20 weeks (average 10.6 weeks), that of cerebral palsy was 6 – 14 weeks (average 8.5 weeks). Botulinum Toxin Type A is a safe and effective biological formulation, can be used for replicated injection, no allergic response, and the treatment is easy and convenient, can be a new method for treatment of dystonia.

Key words: Botulinum Toxin Type A; Hemifacial spasm; Focal dystonia

The cause of primary dystonia is not known. The previous treatments of medicines, seal, acupuncture and moxibustion, operation, etc. are all exploratory, seldom has accurate and permanent curative effect. Recently we applied Botulinum Toxin Type A (LANTOX) in 43 cases local injection treatment of facial spasm and 20 cases of focal dystonia, and obtained satisfactory results, which were reported as follows.

Subject and Method

1. Subject

There were 43 cases of hemifacial spasm and 20 cases of focal dystonia (11 cases of spasmodic torticollis, 5 cases of Meige's Syndrome, 2 cases of writer's cramp, 1 case of multiple sclerosis, 1 case of cerebral palsy), among those 18 were males and 25 females, aged from 18 – 72 years, medical state from 3 months to 13 years, all processed medical, operation, seal, acupuncture and moxibustion or thread burial therapy with no effect. All cases were visited upon 8 weeks to 56 weeks.

2. Method

I) The involved muscles should be examined before and after treatment. Checking once a week after 1 month of injection, later following each month by telephone, letter or visit.

II) Dosage and usage: The drug used was LANTOX for injection that produced by Lanzhou Institute of Biological Products [(93) Drug Test (Lan) S-04]. It was in from of lyophilized crystals, each vial contains 110u, stored in -5 – 20℃ fringe, diluted to 0.1ml/0.25u concentration by 4.4 ml of saline before use. 1 ml skin test syringe with no.4.5 need head was used for injection. Different points and dosages are selected according to diagnosis location and degrees of spasm. i) Hemifacial spasm: select injection into 5 points of orbicular muscle of eye, 4 points of each of large and small zygomatic muscles, buccinator muscle and chin muscle, generally 2.5u each point. ii) Spasmodic torticollis: select injection into 6 points of sternocleidomastoid, 5 points of levator muscle of scapula, upper part of trapezius muscle, 4 points of buccinator muscle and posterior deep cervical muscle, 5u each point. iii) Meige's Syndrome: inject into orbicular muscle of eye, masseter, temporal muscle, internal and lateral pterygoid muscles, digastric muscle, etc, 3 -5 points injection for each piece of muscle, 5u each point. iv) Writer's cramp: for forearms, because the belly of muscle is thin and many overlapping, the injection Grade should not be too deep, 5u each point. v) Multiple sclerosis and cerebral palsy: select injection point according to muscle group of spasmodic location. Injection points of large piece of muscle are more than that of small piece of muscle.

III) EMG examination: Winking eye reflex: among 15 cases of hemifacial spasm, 11 cases had no abnormality, 3 cases could observe decrease of amplitude wave, 1 case increased in amplitude wave. Spasmodic torticollis: 1 case of EMG rest sternocleidomastoid showed 2 parts of fibrillation potential.

3. Efficacy Evaluation

Graded according to spasmodic strength[1]

Grade 0 : No spasm.

Grade 1 : Increase in winking movement by external stimulations.

Grade 2 : Light, slight jitter of eyelid and face muscle, no dystonia.

Grade 3 : Medium, obvious spasm, slight dystonia.

Grade 4: Severe dystonia (cannot drive, read, etc), affect work.

Complete remission: decreased from Grade 2 – 4 to 0; obvious remission: decreased from Grade 4 – 3.

Result

The involved muscles should be examined before and after treatment. Check once a week after 1 month of injection, later followed each month by telephone, letter or visit to understand the conditions after treatment for 6 months to 1 year. Effects occurred

after 3 days of injection in 63 cases, attained the best curative effect at day 12. Among the 43 cases of hemifacial spasm, 39 cases (91%) were complete remission, 4 cases (9%) were obvious remission. Among the 11 cases of spasmodic torticollis, 8 cases (72%) were complete remission, 3 cases (28%) were obvious remission. Among the 5 cases of Meige's Syndrome, 2 cases (40%) were complete remission, 2 cases (40%) were obvious remission, 1 case (20%) were partial remission. Cases of writer's cramp, cerebral palsy, multiple sclerosis were all obvious remission. All 63 cases were effective. Duration of drugs for hemifacial spasm was 8 – 28 weeks (average 12.8 weeks), spasmodic torticollis was 7 – 24 weeks (average 11.4 weeks), Meige's Syndrome was 4 – 10 weeks (average 6 weeks), writer's cramp was 6 – 12 weeks (average 8 weeks), multiple sclerosis was 7 – 20 weeks (average 10.2 weeks), cerebral palsy was 6 – 14 weeks (average 8.5 weeks). If one had certain degree of forceless in face muscle originally, it was more likely for face palsy to occur. Exposure keratitis could naturally recover after 3 – 8 weeks. No adverse response was found upon replicated injection during 3 – 6 weeks.

Discussion

BTXA was firstly injected under EMG monitor into over-contracted eye muscle to replace surgical treatment for strabismus by a ophthalmology doctor Scott in 1978[2]. Afterwards many foreign neurology doctors obtained better results in injection therapy of many kinds of motor disturbance disease of nervous system. Botulinum toxin is an exotoxin produced by G^+ anaerobic botulinum bacillus during reproduction process. According to the difference of toxicity and antigenicity, it is classified into A-G types. Toxin Type A has strong toxicity, is stable and easily to be produced. It has been proved as a safe and effective biological formulation by animal tests clinically. Botulinum Toxic (BTX) selectively actions at surrounding cholinergic nerve endings, inhibits excitation and primary quantum release of acetylcholine, the action is strongest at nerve muscle joints and generally cannot pass through blood-brain barrier. It makes muscle relax and paralyze, thus eyelid and face muscle spasms can be improved[3,4].

In our study, there were 43 cases of hemifacial spasm and 20 cases of focal dystonia, the efficacy was 100%. Compare the data, one could find that percentages of complete remission and obvious remission of hemifacial spasm were higher than that of focal dystonia. The total duration of hemifacial spasm was also longer. For patients of facial spasm, the dosage is 25 – 55u each time; for patients of spasmodic torticollis, the dosage is 220 – 330u each time; for patients of writer's cramp, the dosage is about 110u; for patients of Meige's Syndrome, multiple sclerosis and cerebral palsy, the

dosages are mainly accommodated according to location of spasm, and the injection points that have special values are localized by observation and touch of spasmodic muscle. For the interior thickening muscle, it is better to use EMG guidance. For the females that have small neck, it is better to decrease the dosage of sternocleidomastoid to prevent dysphagia[5]. Multiple-point injection of head and neck muscle can increase efficacy and reduce adverse effects, and for the muscle of four limbs, it is limited to injection of central of belly of muscle. In most patients, recurrent occurs after 3 – 4 months of treatment. In a few cases, no recurrent occurs after 1 year of injection. Recurrent patients can be treated repeatedly. There is no need to increase dosage and the effect is the same as above. In our cases, the largest dosage is 330u, no case processes allergic reaction and general botulinum toxic reaction or forceless in diaphragm.

The application effects of LANTOX local injection in neurology diseases (e.g. eye muscle, facial muscle, etc) are encouraging. It provides an easy and reliable treatment for remission and basic elimination of symptoms, as well as reducing physical and mental suffering, and upgrading life quality of patients. As one of the few effective treatments of neurology, its prospect is wide and optimistic.

References

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