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Botox or Botulinum Toxin is a New Weapon for Neurologists

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Abstract: Almost everyone has heard the word "Botox", but, as a rule, it is associated only with beauty injections and rejuvenation. This article will describe that botulinum therapy goes beyond aesthetics and beauty, and the smoothing of wrinkles can be rather a pleasant side effect. Botulinum therapy is a method of treating various diseases manifested by muscle spasm, pain and autonomic dysfunction using botulinum toxin.
Keywords: Botox, botulinum therapy, toxin family, brain injury, neurologists.

I. INTRODUCTION

Botulinum toxin, also popularly known as Botox, is a drug whose active ingredient is purified botulinum toxin, which helps relax overactive muscles. This property was first discovered by Dr. Brooks back in the mid-20s. The history of evidence-based medical use of the drug begins in 1989, and it was first used in ophthalmology. Currently, this medicine is used by doctors in various fields, such as ophthalmology, urology and, of course, neurology.

II. LITERARY REVIEW AND METHODOLOGY

What is Botulinum toxin? Botulinum toxin type A is:
- Peripheral muscle relaxant
- Blocks the release of acetylcholine in presynaptic cholinergic nerve endings by cleaving the SNAP-25 protein.

Clinically, signs appear within 2-3 days, and the maximum effect is observed within 5-6 weeks, the duration of the effect is about 3-4 months.

Botulinum toxin family - the BT family has 8 immunologically different types, of which toxins types A, B, C1, D, E, F, G are neurotropic. BT type A is the most potent neurotoxin. The toxin is synthesized as a simple polypeptide chain with relatively low activity. It can be activated by bacterial enzymes or trypsin to transform into a 2-chain molecule in which the heavy chain (100 kDa) is linked by a disulfide bond to the light chain (50 kDa). In this form, the toxin molecule is capable of paralyzing neuromuscular cholinergic transmission.

Botox or botulinum toxin is a drug that is used today in almost all areas of clinical medicine with a high level of evidence. In the treatment of many neurological diseases, as well as in the rehabilitation of patients after stroke or traumatic brain injury, intramuscular Botox has the highest level of evidence for reducing muscle tone and improving the passive function of the affected limb.

Every year in the world, about 5 million people suffer a stroke, which results in motor deficits and increased muscle tone, which lead to limited disability and social maladjustment of patients. Rehabilitation of patients often becomes impossible precisely because muscle hyperactivity (spasticity) interferes with functional recovery, causes pain, causes deformation of the affected limbs, etc.

Botulinum toxin is administered intramuscularly, i.e. the target of administration is exclusively the neuromuscular synapse. Botulinum toxin injected into the muscle blocks the transmission of the signal from the nerve to the muscle (the toxin does not allow the production of acetylcholine) and the muscle fiber stops contracting. As a result, the muscles at the site of injection of the toxin "relax" during pathological tension or twitching.

The toxin binds in the first 30 minutes after injection of the drug into the muscle, but the patient begins to feel the effect, depending on the disease, by the end of the first week. An important feature is that the local effect of the toxin is reversible, which is both an advantage and a disadvantage of the method. The full action of the synapse is restored on average after 3-4 months, after which a second course of injections is necessary.

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Among the advantages of the botulinum therapy method, it is customary to highlight its safety, the minimum number of side effects and contraindications (except for individual tolerance and myasthenia gravis), and a fairly long duration of action.

New “weapon” of neurologists of the Republican Hospital in the fight against the consequences of stroke, migraines and torticollis

At the Regional Vascular Center of the Russian Clinical Hospital named after. N.A. Semashko On April 11, a master class was held by Yuri Aleksandrovich Seliverstov, candidate of medical sciences, researcher at the Scientific Center of Neurology. The doctor told neurologists of the Republican Clinical Hospital and other hospitals about the possibilities and areas of use of Botox in the treatment of neurological diseases.

After the theory, a practical part took place, during which Yuri Seliverstov, using a mobile ultrasound machine, demonstrated to a fellow doctor the search and identification of the necessary muscles. Later the procedures were performed on four patients. A 37-year-old man has been suffering for several years from a spasm of the neck muscles, the so-called spasmodic torticollis or cervical dystonia. Previously he worked as a cook, but due to illness, today he works as a watchman. Botox injections improved his quality of life. Two women have suffered from chronic migraines for twenty years and today decided to try the effects of Botox. Another patient developed torticollis six months ago and is undergoing conservative treatment.

III. DISCUSSION AND RESULTS

All kinds of pain syndromes occur in people quite often, but few people immediately seek help from a doctor about this. Usually they try to solve the problem with the help of massage, manual therapy, and folk remedies. But in many cases, a person needs the help of a neurologist who first makes a diagnosis and only then prescribes treatment.

But a qualified doctor, of course, will not prescribe Botox injections to absolutely all patients with headache and neck pain. The fact is that botulinum toxin fights muscle strain, and it does not always accompany a headache. In about half of the cases, the pain is actually due to muscle spasm. Then the use of Botox is justified and will give good results. But there will be no benefit from the injections or it will remain minimal if the pain is caused by other reasons.

Clinical evidence suggests that botulinum toxin:

- Reduces pain
- Reduces neurogenic inflammation
- Reduces spasm

Increases the pain threshold of the skin in a model of capsaicin-induced trigeminal sensitization (migraine) Safety of botulinum toxin for the body

Botulinum toxin is used today in more than 60 countries around the world for various diseases. The registration of this medicine was preceded by numerous clinical trials that confirmed its effectiveness and safety.

There are very few contraindications for the botulinum therapy procedure:

- Hypersensitivity to any component of the drug
- Inflammatory process at the site of the proposed injection

There are officially registered indications for botulinum therapy in neurology:

Spasticity (for example, in the arms/legs due to various diseases of the nervous system, for example, multiple sclerosis or the consequences of cerebrovascular accidents)

- Movement disorders
- tremor
- Hemifacial spasm (involuntary contraction of facial muscles)
- Bruxism (tension in the chewing muscles)
- Migraine and tension headaches, in some cases a positive effect from cluster headaches has been described
- Consequences of facial nerve neuropathy
- Myofascial pain syndrome.

For each of the above indications, the dose of the drug is determined individually with the doctor.

However, for some of them there are clear administration protocols, such as for migraine:

- The recommended dose is 155-195 units
- The drug is administered intramuscularly, 5 units at 31-39 points according to the PREEMPT*** protocol
- Injections should be distributed between 7 muscle areas.
- In case of predominance of pain in any localization, additional injection of the drug into 1-3 muscle groups (occipital, temporal, trapezius or also into the masticatory muscles) is possible.

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1) Botox injections are addictive.

There is no physiological dependence on the drug, since it is completely eliminated from the body after 3-4 months after the procedure, after which muscle activity is completely restored. Psychological dependence can only be considered within the framework of "beauty injections", because You may want to get rid of wrinkles again.

2) Botulinum toxin is poison! What is the risk of infection?

Botulinum toxin is a drug that has passed the most stringent stages of control. For more than 60 years of its use, not a single case of poisoning has been recorded. The therapeutic dosage used for treatment in neurology/cosmetology/ophthalmology, etc. is completely safe.

3) Immunity to botulinum toxin – myth or reality?

Yes, "immunity" to botulinum toxin can develop, BUT, only if the injections are repeated without waiting for the previous ones to expire. This happens extremely rarely and, as a rule, the effect is temporary. It is enough to take a break from botulinum therapy and wait until the antibodies to the toxin are destroyed.

4) Injections are painful.

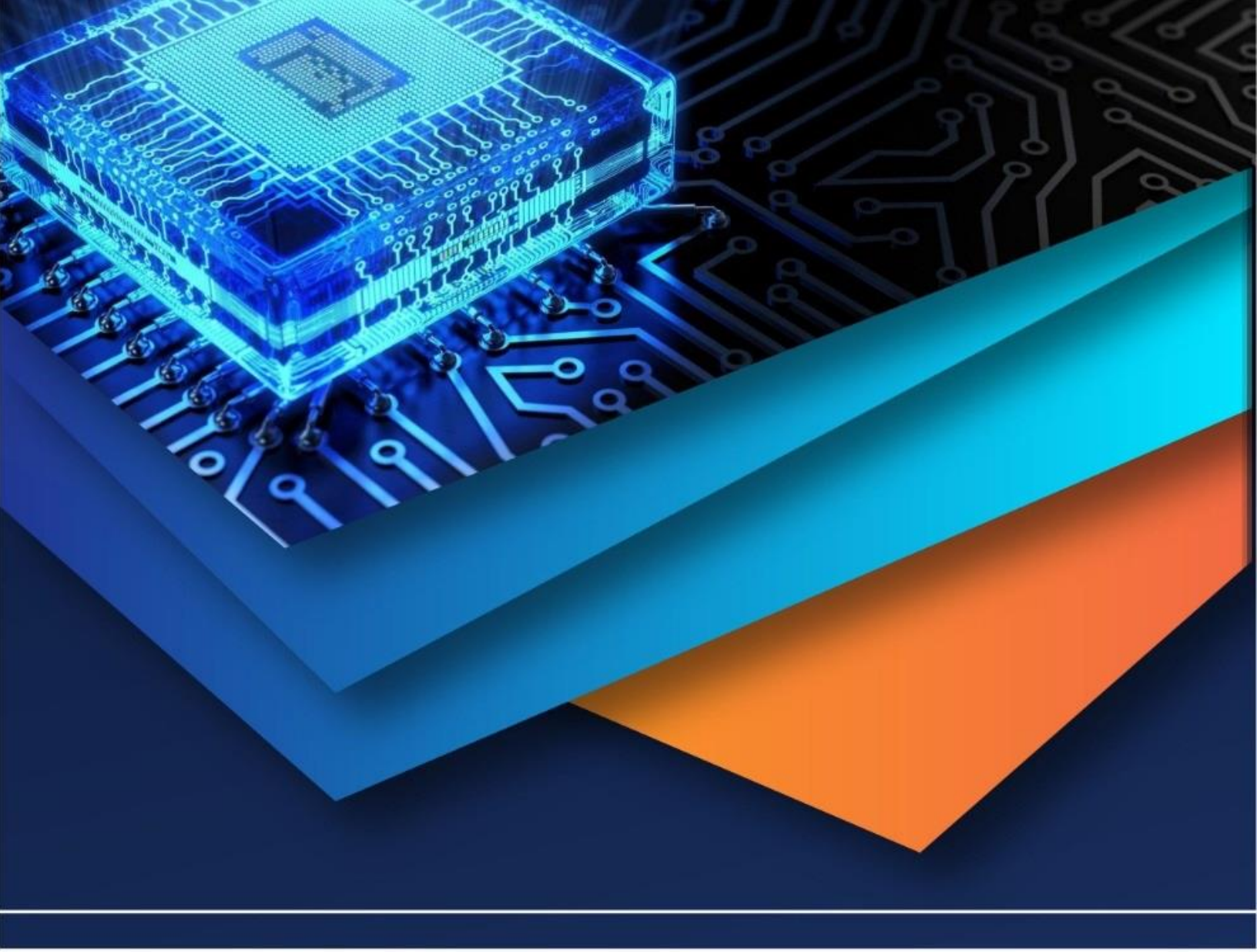
No, it's no more painful than standard intramuscular injections. There may be increased sensitivity when injecting into trigger points, but the professionalism and experience of the specialist who gives these injections is also important here.

5) A large number of side effects!

Standard side effects - hyperemia, pain at the injection site, nausea, headache, hematomas, swelling of the skin - are a normal reaction to botulinum toxin. They pass within two, maximum three, days.

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