



## Indian Family of Cerebral Palsy

Voluntary Organization dedicated for the welfare of the people with cerebral palsy since 1993

### BOTULINUM TOXIN AND ITS USES

#### DISCOVERY

I am Mr. Clostridium Microbe (Mr. C. B. Microbe). I have caused sufferings to the people who have consumed me with the food, which was prepared unhygienically and was preserved improperly. Do you know why I have been named botulinum? Because, first time I was discovered in sausage. It was just a century before (1896), in a village of Belgium, 34 musicians ate me along with raw stale ham and suffered ill health. An intelligent scientist Ermengem discovered me from the ham; otherwise you would have not known me.

#### BACTERIA

In fact, I am a very innocent Microbe. I live as spores in X (X=soil, vegetables, sea mud, hay, silage, animal manure, in the intestine of animals, etc.,). In this form I do not cause ill health and it is difficult for you also to kill me. If you really want to kill me you have to boil me for several hours (100 degree Celsius) or keep me in a sterilizer (120 degree Celsius) for 20 minutes. But if you do not do this and contaminate your food with X, and then pack this food in such a way that no air is left around me, I can become angry and produce protoxin (the chemical which is not harmful but threatens to cause harm). At some stage my own body's chemicals start killing me. In this process the innocent protoxin, gets converted into harmful toxin, which even in its very minute quantity (0.1 microgram) can cause ill health or can even kill a person. It is one of the most lethal bacterial toxins ever known to human beings.

#### TOXIN

Now, I shall tell you the story of my enemy, the toxin, whose liberation from me kills me. If you want to destroy this toxin and want to save yourself, beware of improperly canned food, food with bubbles or any stale food; and if you want to destroy the toxin, boil the food for 20 minutes or heat it in pressure cooker (120 degree Celsius for 10 minutes). Because, once it enters into your digestive system it cannot be converted into non-toxic simpler and safe substance. It is absorbed as such from intestine, goes to nervous system, blocks the synthesis or release of a chemical known as Acetyl Choline (A. Ch.) at the nerve endings which supply muscles (i.e. at myoneural junction). Due to this, the information coming from the brain to muscles gets stopped right at this junction. A. Ch. is an essential chemical bridge or transporter of the neural information from nerve terminal to the muscle. In such a situation, the muscles do not work and the person develops difficulty in moving the limbs, swallowing, speaking, breathing, etc.

#### MEDICATED TOXIN AND ITS USES

Around two decades ago, some human beings understood me as their friend and started utilizing my toxin for improvement in various neurological conditions. They produced a

preparation from my toxin, which could be injected locally into the muscle to overcome excessive activity without causing local or distant paralysis. What an excellent idea. You may use my medicated form in the following neurological conditions.

a) Focal Dystonia Blepharospasm - involuntary closure of eyes. Spasmodic torticollis - awkward neck posture Writer's cramp - difficulty while writing Laryngeal dystonia - a strained or whispering voice (spasmodic dystonia) b) Facial spasm c) Squint d) Detrusor - sphincter dyssynergia e) Tremors

#### METHOD OF INJECTION

The toxin is injected at multiple sites into the affected muscle. Electromyography - a process in which electrical potential of the muscle is recorded - helps in identification of affected muscles.

A particular amount of the toxin according to muscle mass and person's weight is calculated and injected into the muscle.

#### HARMFUL SIDE EFFECTS

a) Spread of toxin to adjacent muscles.

E.g. Injection of toxin into orbicularis oculi for blepharospasm can cause ptosis and diplopia; swallowing difficulty while treating spasmodic torticollis, b) Spread to distant muscle giving rise to even respiratory paralysis. c) Systemic spread, diplopia, dysphagia, dry mouth, and slurred speech

Descending weakness, affecting cranial nerves; neck, arm, leg and thoracic muscles, autonomic disturbances, nausea, vomiting, additional pain, constipation, urinary retention.

#### USE OF MEDICATED BOTULINUM TOXIN IN SPASTICITY

The medicated toxin is very useful in movement disorders, which affect muscles having small bulks. Similarly it is also useful in spastic muscles having small size and bulk. This is seen in the following clinical situations.

a) Child with 2 to 3 years age b) Focal spasticity (spasticity affecting a few muscles only)

The effect of MEDICATED TOXIN in relieving spasticity in such conditions is quite good. But the effect lasts only 3-4 months. Therefore, the dose has to be re-administered regularly. The cost of each vial is Rs. 15,000/-. The cost of treatment can go up to Rs. 20,000 to 70,000. Not only this, many cases have to undergo surgery for permanent optimization of tone at a later date.

However, the temporary relief in spasticity by this toxin of may be beneficial because

a) It facilitates improvement in strength by making physical and occupational therapy more effective.

b) It prevents muscles shortening (contracture) by more effective and comfortable stretching of the affected muscles through intermittent stretching exercises and continuous stretch under plaster cast.

Therefore, the medicated toxin administration can be considered in very young children who have only a few muscles affected with spasticity. The goals are to make physical treatment more effective and prevent contracture and to improve motor functions. This procedure is not very beneficial in people

a) having severe diffuse spasticity involving many groups of muscles b) who are quite grown up and c) who have no functions in the affected part e) have developed resistance to this toxin following previous injections

The facility of Botulinum Toxin administration is available at many places in India. At all these places mostly the people having dystonia are treated.

It is important to inject this expensive toxin only if significant functional improvement is more or less certain. However, sometimes single dose may have to given to be certain about the results of the about the results of the permanent ablative procedures like surgical deservation of peripheral nerves.

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