Botulinum toxin injection for CRPS type 1.

We describe a case of a patient who underwent subcutaneous Botulinum Toxin (BT) injection for CRPS type 1. The patient was followed regularly in the outpatient clinic and was maintained on long acting and short acting oral narcotic medications. Additionally the patient required antidepressants, antiepileptic, and muscle relaxant medication trials, epidural injection, sympathetic blocks and spinal cord stimulator placement and subsequent removal. The patient had tried and failed multiple opioid medications, local anesthetics and dorsal column stimulator trials. In this case, Botulinum toxin A has provided improved pain relief, hand function as well as improvement in Activities of Daily Living (ADLs).

CRPS is difficult condition to treat effectively. Botulinum toxin has been used in many painful conditions. To date there has only been one case series with limited results. High pain relief, hand function as well as improvement in ADLs.

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The Role of Botulinum Toxin in Complex Regional Pain Syndrome: A Case report

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Introduction

Complex regional pain syndrome (CRPS) is a chronic pain condition that can affect any area of the body, but often affects an arm or a leg. There are two types of CRPS, CRPS-I, also known as reflex sympathetic dystrophy (RSD). This refers to cases of CRPS that do not involve nerve injury, may occur in any injury. CRPS-II; also known as causalgia. CRPS-II refers to those CRPS cases in which one or more nerves are injured. Due to the diversity of pain and complicated mechanisms many treatments including antidepressants, antiepileptic, local anesthetics, methyl-D-aspartate receptor antagonistic, IV regional anesthetics and dorsal column stimulator trial and placement have been used with limited effect.

Botulinum Toxin (BT) is used to treat painful muscle hypertonicity disorders frequently and substantial pain relief is reported. So far this pain relief attributed to the reduction of the muscle hypertonicity. However, formalin-induced pain in animals can be reduced by BT direct analgesic effect. Probably such effect of BT is based on the action on neurotransmitters other than acetylcholine.

Substance P (SP), a neuropeptide involved in pain perception, vasodilatation and neuroinflammation, can be blocked by BT together with acetylcholine in the iris muscles of rabbits as well as in cultured dorsal root ganglia neurons. Association of this inhibition with a decrease of SNAP 25 suggests a direct BT effect. BT-induced suppression of SP can also be demonstrated in embryonic rat dorsal root ganglia neurons. When different BT serotypes were tested, BT-A produced the strongest SP suppression. BT has also been shown to suppress the release of glutamate, another neurotransmitter involved in nociception, in the periphery and in the dorsal horn confirming earlier findings of BT-induced inhibition of glutamate release from cerebrocortical synaptosomes. The release of noradrenaline in PC12 cells and calcitonin gene related peptide (CGRP) in autonomic vascular nerve terminals could also be reduced by BT suggesting additional possible mechanisms for BT effects on pain transmission.

We describe a case of a patient who underwent subcutaneous Botulinum toxin injection for CRPS type 1.

Setting

Outpatient Physical Medicine and Rehabilitation clinic in an academic hospital.

Case presentation

A 44 year old female with 11 year history of complex regional pain syndrome type 1 (CRPS) affecting her left upper extremity after remote injury after lifting a heavy patient while working in skilled nursing facility. Prior to Botulinum toxin subcutaneous injection, the patient had tried and failed multiple opioid and non opioid medication including antiepileptic, NSAIDS, antispasmodic/muscle relaxant medication trials, epidural injection, sympathetic blocks and spinal cord stimulator placement and subsequent removal.

The patient was followed regularly in the outpatient clinic and was maintained on long acting and short acting oral narcotic medications with continued significant allodynia, hyperalgesia and severe burning pain of left hand. The patient had decreased range of motion of left upper extremity at shoulder, elbow, wrist and finger secondary to pain. The patient was noted have visible skin and nail changes compared to right upper extremity. Due to poor pain relief, patient underwent injection of 100 units of Botulinum toxin A subcutaneously at 20 sites, 5 units/site, and 10 cm apart on the dorsum of the left hand. The McGill pain questionnaire was used for pain assessment, prior to treatment, weekly for 2 months and 3 months post injection. Physical examination was performed to assess hand function before injection, at 2 month follow up visit and at three month follow up visit.

Result

The patient completed the McGill pain questionnaire which showed 33 % relief in pain (Fig 1 & 2). Patient also had significant improvement in hand motor skill and improvement of activities of daily living. Additionally the patient required 50% less breakthrough narcotic pain medication during the 2 month period after Botulinum toxin A injection.

Discussion

CRPS is difficult condition to treat effectively. Botulinum toxin has been used in may painful conditions. To date there has only been one case series with limited results. This case indicates that Botulinum toxin may play an important role in the treatment of patient with refractory CRPS.

References


Figure 1
Figure 2
Figure 3