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An introduction to Managing Botulinum Toxin Complications

Dr Ahsan Ullah provides an overview of the possible complications and side effects that can arise when injecting botulinum neurotoxin A and advises the potential management strategies

Introduction

As with all treatments, there are risks, complications and side effects involved, and, for botulinum neurotoxin A (BoNT-A) injections, there are no exceptions. This article will describe some of the main complications associated with administering BoNT-A injections, categorise them into subjective and short-term complications, and provide an evidence-based protocol for safe and successful management.

Subjective complications of BoNT-A and its management options

Undesired aesthetic result

Complication: This often can't be measured as it varies between patients, whose treatments simply may not meet their expectations. However, there is a chance you may have overcorrected or under-corrected the patient's rhytides.

Management: Firstly, it is vital that, during the consultation, practitioners have a full discussion with the patient about their expectations and desired results. It is encouraged that a validated wrinkle scale of resting and dynamic states, such as the Glogau scale, is used to help provide objective recorded evidence. Be honest with the patient and ensure that they are fully aware of what the results are likely to be and do not provide any misleading information. Practitioners must also ensure that they properly assess the patient and their concerns and, once the treatment has been decided, go through an adequate consent process with them. After injecting, practitioners should encourage all patients to attend a two-week follow-up appointment to discuss any potential concerns. Here the practitioner can address any under-correction, by injecting more into the desired area, or manage overcorrection by injecting the contralateral muscles to oppose the overcorrection. We are all aware of the 'Spock effect' with the lateral aspect of the eyebrow being raised too high, leading to the infamous look of Mr Spock from the fictional TV show Star Trek. To correct this, a small amount of BoNT-A can be inserted above the eyebrow in the frontalis elevator muscles, should the patient so desire, to allow the muscle to settle.

Asymmetric result

Complication: For BoNT-A treatments, the main asymmetry is commonly noted in the brow area. Beauty is often described as a symmetry of features, so when one eyebrow is higher than the other the symmetry is disturbed. This can occur when the frontalis muscle is stronger than the other muscle, or if insufficient toxin has been injected.

Management: Asymmetry simply requires a follow-up appointment and the area of concern can be injected to either lower the muscle, or alternatively correct the asymmetry by injecting the contralateral muscles. For example, as mentioned earlier, if the brow is raised too high then the frontalis elevator muscle can be injected to drop the elevated eyebrow.

Short-term complications and side effects of BoNT-A and its management options

Side effect: Ecchymosis or bruising often occurs as a result of injuring a blood vessel at the site of the injection and most commonly occurs around the ocular area.[1] Patients might feel temporary pain or discomfort,[2] which is associated with the needle puncturing the skin. Pain that is higher than normal is often associated with the practitioner using the incorrect needle size – usually recommended to be 30 gauge.[3] Headaches and hypoesthesia are common side effects, which usually last for around 24-48 hours after having BoNT-A treatment.[1,4]

Management: Even with the best of techniques, experienced injectors can sometimes perforate a blood vessel resulting in a bruise. Managing this with simple tamponade at the time of the bleed, which usually takes between a few seconds to a minute, can decrease the size of the bruise formed or even prevent it from appearing. Preventative methods for bruising include applying ice to the site prior to the injection causing vasoconstrictive effects,[1] and also ensuring that the patient is not taking any blood-thinning medications such as warfarin or aspirin, and doesn't have any underlying clotting problems.[1] To minimise pain associated with the injection, topical anaesthetic creams can be used. Technique is also a major factor here, and practitioners need to ensure they have had adequate training, that align with Health Education England guidelines[5] to ensure they are comfortable and able to perform BoNT-A injections. To minimise pain, suggested techniques include having the needle bevel up and injecting slowly.[6]

Headaches are a common short-term side effect as the toxin initially causes muscle spasm and then complete paralysis.[7] On occasions, over-the-counter analgesics may help.

Allergic reaction

Complication: Skin reactions and erythema can occur at any injection site, however sometimes, although rarely, it can be associated with an allergic reaction and, even rarer, an anaphylactic reaction – the signs

of which can be immediate reddening of the face, lip swelling and difficulty breathing.[8]

Management: Erythema should settle within 24 hours; if it lasts any longer then an antihistamine can help. If it is an anaphylactic reaction then this is a medical emergency. In such circumstances, if the practitioner is trained in dealing with anaphylactic reactions, which most UK practitioners are, they should start treatment through an adrenalin injection, however an ambulance should immediately be called before continually monitoring the patient in case of airway compromise.[8] It is the practitioner's responsibility to keep emergency medication on site, although this is not a legal requirement. Practitioners should only prescribe and administer BoNT-A if they are appropriately trained in how to deal with these types of emergencies. To help to prevent allergic reactions, a thorough medical history should be taken to rule out previous allergic reactions to other brands of BoNT-A, and practitioners should be extra cautious in treating someone with multiple allergies as they may have a higher risk of being allergic to BoNT-A.

Ptosis and diplopia

Complication/side effect: Brow and lid ptosis occurs when incorrect placement or displacement of the toxin occurs too close to the lateral brow resulting in the weakening of the lateral frontalis and localised spread to the levator palpebrae superioris.[9] Similarly ptosis of the upper or lower lip can occur if injected too closely to the vermillion border. Diplopia (double vision) is also a risk that can occur.[10]

Management: Brow and lid ptosis are best avoided by employing a good technique. Brow ptosis is often caused by the treatment of the frontalis muscle in patients with existing brow ptosis, but avoiding the outer brow area when injecting toxins can minimise the risk for those who do not already have it. For lips, avoid the vermillion border when injecting, however if this has already occurred it can be best to wait for the toxin effect to gradually wear off. In such cases, one should act with caution and I recommend that small doses, such as 1-2 units, are given to prevent localised spread and extreme changes in the muscles elevator/depressor functions. Prevention is better than having to treat a complication so I recommend that patients are given smaller doses and called back for a two-week follow-up, where additional amounts can be administered if necessary.

If the patient requires immediate improvement, then they should be referred to a local ophthalmologist for further assessment and review. Once the patient has been referred an alpha agonist eye drop may be advised, which causes contraction of the adrenergic muscles and results in a 1-2mm elevation of the lash margin, which can make the ptosis appear more symmetrical. However this symptomatic treatment should be continued daily until resolution of the ptosis.[3]

If diplopia occurs, then the patient should be referred to the local ophthalmologist for review, as it is likely that one of the intraocular muscles has been injected. An ophthalmologist who has experience in BoNT-A injecting and is skilled in intraoccular muscle surgery would best manage this. I would recommend that practitioners are aware of the ophthalmologists in their area who have these skills and knowledge. The ophthalmologist may be able to inject the antagonistic intraocular muscle to allow correction of the diplopia.[10]

Spread of toxin from site of injection

Complication: Spread of the toxin from the injection site can lead to many complications depending upon the area from where it has spread. Around the eye, for example, complications such as ptosis, lid ectropion, strabismus, lagophthalmos or brow raise can occur.[11,12] Incorrect injections on the elevators around the lips can result in depression of the vermillion borders of the lips.

Management: Injecting the correct recommended doses of toxins as per the manufacturer's guidance, and having good anatomical knowledge of the injection area can prevent these complications. I recommend that minimal amounts are injected as required and smaller units spread out rather than large bolus injections, which can result in more uncontrolled spread. If these complications arise, you should refer the patient to a local ophthalmologist, who may advise alpha agonist drops.

Infection

Complication: An area of infection can develop at any injection site if the area is not adequately prepared.

Management: To prevent infection, ensure that the injection site is cleaned with an antiseptic solution with all makeup residue removed. To avoid contamination, an aseptic technique should be employed. After the treatment, to prevent infection, the patient should be instructed not to touch the area until it has healed nor apply makeup for at least six hours to allow the open injection sites to close.

To manage infections, a course of antibiotics and close monitoring of the area is essential to ensure that an abscess does not form, which could potentially result in a scar.

Summary

All toxins are associated with immediate and short-term complications, such as swelling, redness and bruising. It is vital that the practitioner makes the patient aware of these complications prior to treatment and accepts that there is a chance that these can occur, but, when appropriate, assures patients that they often settle spontaneously. Although there has been, and probably will continue to be, stories in the media about BoNT-A complications, with a constructive and active management plan, supported with appropriate experience, practitioners can manage and prevent most of these complications.

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