BOTULISM FOLLOWING SKIN POPPING IN A 50 YEAR OLD MAN: A CASE REPORT

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ABSTRACT

INTRODUCTION

Botulism can be caused by “Skin Popping”. With recreational use of heroin administered subcutaneously there is a risk of developing Botulism, if there is contamination of the drug with Botulinum spores. This condition can be fatal if it is not treated appropriately.

CASE PRESENTATION

We present a case of Botulism seen in 50 yr old gentleman who presented to A& E complaining of Diplopia, Dysphagia and Shortness of breath for two days. He had difficulty in opening his eyes with associated dysphagia to solids and later to liquids. He was known to be IV Drug abuser, and was currently skin popping with Heroin. The diagnosis of Botulism was confirmed by blood culture and gram stain and this condition was treated with antibiotics, TT booster and Botulinum Antitoxin. This potentially lethal infection resolved completely and he made a full recovery.

CONCLUSION

This case demonstrates that contaminated Heroin when used through the method of Skin Popping may be a source of Botulinum infection.

CASE PRESENTATION

50 yr old man, electrical engineer, lives alone, Smoker, drinks alcohol socially. Presenting symptoms 2days of:

- Double Vision
- Dysphagia
- SOB
HPC:
First noticed double vision 2 days before presentation to A/E Department.
Symptoms initially intermittent.
No associated Fever, Photophobia, rash, neck stiffness.
Early difficulty in opening eyes.
Later developed dysphagia and shortness of breath on following day.
Dysphagia initially to solids and subsequently to liquids
No limb weakness.
Shortness of breath present on mild exertion from onset of symptoms.

PMH:
No history of Hypertension/Myocardial Infarction/ Cerebrovascular accident/ Diabetes Mellitus/ Asthma/ Tuberculosis.

IVDU HEROIN

O/E
Afebrile, PR: 76/min, regular, BP 118/60 RR: 16, Sat 97% RA. GCS 15/15
Cap Refill<2sec, JVP Not raised,
No pedal oedema,
MULTIPLE INJECTION MARKS NOTED OVER ABDOMEN AND GLUTEAL REGION.
Redness with indurations in gluteal region around injection sites.
Healing wound in the right groin overlying the region of the femoral vein [used for IV drug injections]
Speech normal,
Ptosis noted
Eye movements appeared, normal, but diplopia noted on lateral gaze,
Moving all 4 limbs, but fatigability noted on persistent movement
No focal neurological deficits.
Abdomen soft, Non-tender, multiple healed scars from skin popping noted around umbilicus,
No organomegaly
Bowel sounds normal.
Cardiovascular and Respiratory systems: nothing abnormal detected.

Tests:
Haemoglobin: 13.7 g/dl, White cells: 12.1x10(-9)/L, Platelets: 313x10(-9)/L Mean Corpuscular Volume:84.9 fl, Sodium: 138mmol/L, Potassium: 4.0mmol/L, Urea: 4.4mmol/L, Creatinine: 62umol/L, Estimated Glomerular Filtration Rate: >90 ml/min, Chloride:101mmol/L, ALP: 134IU/L, ALT: 16IU/L, GGT: 38IU/L, Alb: 41g/L, Corrected Ca: 2.47mmol/L, CRP: 19mg/L, Thyroid Stimulating Hormone: 0.77mIU/L, Free Thyroxin: 19.44pmol/L,
Acetylcholine Receptor AB: 0.03nmol/L, [NORMAL RANGE: 0.05nmol/L] MRSA: Not Isolated, Blood Culture: Negative.

Treated with:
Benzyl Penicillin, Metronidazole, Methadone, Ensure milk, Vitamin B strong. Botulinum antitoxin, TT booster

DISCUSSION

Botulism is a rare but serious paralytic illness caused by botulinum toxin. The toxin is produced by the bacteria *Clostridium botulinum* - an anaerobic, gram positive, spore-forming rod. It’s one of the most powerful known toxins: about one microgram is lethal to humans.

The toxin acts by: blocking nerve functions and leads to respiratory and musculoskeletal paralysis.

There are three main kinds of botulism:

- **Infant botulism** or intestinal botulism – Spores in the intestines release toxin.

- **Food borne botulism** – eating foods contaminated with toxin. This can be extremely dangerous as a public health risk because multiple persons can consume the poison from a single contaminated food source.

- **Wound botulism** – The toxin is produced in a wound infected with *Clostridium Botulinum*. There is a particular association with IVDU and skin popping. It is uncommon in developing countries but the most common cause of botulism in seen in developed countries.

All forms of botulism can be lethal and are always considered medical emergencies.

SKIN POPPING

This is a method of administration of recreational drugs (including Heroin) by injecting the substance or drug under the skin. This can include subcutaneous placement or intradermal placement although the term is also rarely used to denote intramuscular injection.

Following injection there is central pallor surrounded by ecchymosis at the site. Vasocostriction occurs locally at the injection site with haemorrhage in the surrounding tissue.
SYMPTOMS

For food-borne botulism symptoms are seen between 12–38 hours after consuming the botulinum toxin. However, they can occur as early as 6 hours or as late as 10 days after, in wound botulism symptoms occur between 4–14 days after inoculation.

Typical symptoms include:

- Dry mouth,
- Double and/or blurred vision,
- Difficulty swallowing,
- Muscle weakness,
- Drooping eyelids,
- Difficult breathing,
- Slurred speech,
- Vomiting, urinary incontinence and sometimes diarrhoea [these symptoms may progress, leading to paralytic ileus with severe constipation]

The respiratory muscles are also affected which may lead to death from respiratory failure.

MECHANISM

The presence of Botulinum Toxin inhibits the release of Acetylcholine from motor neurons, at the myofibre synapse of the neuro-muscular junction. This results in a loss of muscle function, and flaccid paralysis.

DIAGNOSIS

The condition of Botulism is diagnosed by consideration of history and physical examination.

Differential Diagnosis might include:
- Guillain-Barré syndrome
- Stroke
- Myasthenia gravis [can closely mimic botulism. Special tests may be needed to differentiate]

INVESTIGATIONS

Brain scan,
Cerebrospinal fluid examination,
Nerve conduction test (EMG),
Edrophonium Chloride (Tensilon) test for myasthenia gravis.
Search for botulinum toxin:
Toxin may be identified in the feed, stomach or intestinal contents vomit or faces.
Toxin is occasionally found in the blood. by ELISA, technique and/or Electrochemiluminescent (ECL) tests / Mouse inoculation or feeding trials

TREATMENT for food borne & Wound Botulism

Elimination of toxin by inducing vomiting or by use of enemas.
In early diagnosis:
Give passive immunity by i.v. infusion of [horse-derived] antitoxin. This directly blocks the action of the toxin.
This method of treatment can prevent clinical deterioration, but full recovery may still take many weeks.
Careful attention should be paid to the infected wounds / cutaneous abscesses produced by the body popping process. These should be examined by a surgeon and will usually require, surgical drainage / excision.
Good supportive care in a hospital is the mainstay of therapy for all forms of botulism.

Wound botulism is caused by the development of local clostridium botulinum abscess leading to release of botulinum toxin into the general circulation. The condition is associated with contaminated traumatic wounds and cutaneous abscesses and has been reported in recreational drug users, such as those injecting heroin or sniffing cocaine. Up to the end of 1999 there were no confirmed cases of wound botulism reported in the UK. Between the beginning of 2000 and the end of December 2002, there were 33 clinically diagnosed cases of wound botulism in the UK and Ireland. All cases had injected heroin into muscle or by 'skin popping'. The clinical diagnosis was confirmed by laboratory tests in 20 of these cases. Eighteen cases were caused by type A toxin and two by type B toxin. (1)

In 1982 to 1983 a number of cases were reported of a neurologic illness characterized by a symmetric descending paralysis in six drug abusers from widely separated geographic areas. Botulism was confirmed in two patients; type B botulinal toxin was found and Clostridium botulinum was isolated from a small abscess in one, and type A botulinal toxin was found in the serum of the other. The clinical illness in the remaining four patients, although not laboratory confirmed, was also compatible with botulism. None of the patients had histories that were suggestive of food-borne botulism, and wound botulism was suspected as the cause of illness on clinical grounds.
Tetanus associated with parenteral drug abuse is a well recognised phenomenon that has been extensively reported; wound botulism is a similar toxin-mediated clostridial infection that may occur as a complication of chronic drug abuse. (2)

Following the introduction of black tar heroin mainly from Mexico in the 1980s, cases of wound botulism dramatically increased in the western United States. Contamination with spores of *Clostridium botulinum* of black tar heroin occurs along the distribution line. The heating of heroin powder to solubilise it for subcutaneous injection (“skin popping”) does not kill the spores. *Clostridium* spores germinate in the anaerobic tissue environment of the subcutaneous tissues and release botulinum toxin type A or B. Unless frank skin abscesses are found in the patient, the clinical diagnosis is often challenging. Facilitation of compound muscle action potential by repetitive nerve stimulation at 20 to 50 Hz is an important and rapid diagnostic test. Definite diagnosis is made by detection of botulinum toxin in serum or isolation of *C. botulinum* from the abscess. Early treatment with equine ABE botulinum antitoxin obtained from the Centres for Disease Control and Prevention often shortens the time on a ventilator. (3)

**CONCLUSION**

Skin Popping with Heroin carries a risk of *Clostridium Botulinum* infection. Botulism as a possible entity must be considered in all patients where a history of Skin Popping has been elicited.

**COMPETING INTERESTS**

None.

**REFERENCES**

1. Brett MM, Hallas G, Mpamugo O. Health Protection Agency and Reference Microbiology Division, 61 Colindale Avenue, London NW9 5HT, UK.