

Gurminder Singh · Martin B. H. Kelly

Botox: an ‘elixir of youth’?

Received: 10 March 2003 / Accepted: 6 May 2003 / Published online: 17 June 2003
© Springer-Verlag 2003

Botox is a purified crystalline form of exotoxin type A produced by the bacterium *Clostridium botulinum*. Its mechanism of action is to inhibit the release of acetylcholine at the neuromuscular junction, with a dose-related response that is maximal 5–7 days after injection [7]. Temporary muscle fibre atrophy and demyelination changes at the nerve terminal occur. However, axonal re-sprouting gradually reverses the paralysis, so that normal function returns within 3–6 months, and the drug has no reported long-lasting effects. However, this may not be completely true.

For the past 50 years the principal use of botox has been chemodenervation of the periocular region in the treatment of spastic dystonias. Other therapeutic indications continue to expand, including strabismus, corneal exposure, migraine headaches, and hyperhidrosis. However, it is the serendipitous observation that botox eliminates dynamic facial wrinkles that has propelled the drug’s status to almost omnipotent regard in both the medical and lay fora. Already well established by 1992, botox injection is the fastest growing cosmetic procedure. Its use has now increased by 120% compared with 1999, and it continues to enjoy an exponential rise in popularity [2]. Its principal demand is to eliminate dynamic frown lines of the forehead, the glabellar region, and the ‘crow’s feet’ wrinkles around the eyes. As the stigma of cosmetic procedures slowly diminishes, the appeal of an ‘elixir of youth’ is greater in today’s society than it ever was before. Media enthusiasm for the substance is feverish, physicians of all specialties are embracing its ease of administration, and even high-street chemists are jostling for a chance to deliver botox to anyone who appears even slightly anxious.

The physiological adversities of botox have been extensively reviewed [4]. Local complications such as pain, oedema, ecchymosis, and short-term hyperaesthesia may be related to the injection site. Immunological complications such as acute type I reactions have been reported, and systemic reactions include nausea, malaise, and distant rashes. Dose-related complications include the unwanted loss of facial expression (‘mask-like’ faces) and incomplete muscle paralysis, leaving residual rhytides. Rarely, dissemination of the drug into the orbit may cause ptosis or diplopia. Overall, the physiological safety profile of botox is considered to be excellent, and due to its temporary effects any adverse reactions are expected to last only a few weeks. While the use of the drug continues to be advised against in pregnancy, no intra-uterine complications have been reported.

Until recently, negative consequences of the treatment from a psychological perspective have largely been ignored [5]. Possible reasons for this include the temporary nature of its effects, the non-invasive delivery of the drug, and the notion that psychological problems do not occur with cosmetic treatments. This may be wrong. For a treatment aimed at eliminating the signs of anxiety, it generates a fair amount itself. First, distress may be associated with the actual procedure. Patients with pre-morbid psychological vulnerability or problems such as ‘blood, injection, injury’ phobia are more susceptible to intensified distress, particularly if they have co-morbid fears of being treated with a ‘deadly toxin’ [1]. One example is that patients experiencing a panic attack during the administration of botox usually develop negative psycho-physiological sequelae [6]. Second, individuals who depend heavily upon demonstrative facial expressions (e.g. actors, politicians, salespersons) can be ‘psychologically unprepared’ for botox. Even though they may be aware of the changes that are likely to take place, severe emotional distress results from the compromising effects to their socio-linguistic skills after being treated with botox [3].

It is the third factor, however, which is of greatest concern. Botox is efficacious in providing the opportunity to

An invited commentary to this paper is available at:
<http://dx.doi.org/10.1007/s00238-003-0592-2>

G. Singh (✉) · M. B. H. Kelly
Craniofacial Unit, Chelsea & Westminster Hospital,
369 Fulham Road, London, SW10 9NH, UK
e-mail: gurminder.singh@kcl.ac.uk

shut away signs of upper facial ageing into a cupboard—a cupboard with a faulty lock. When the doors swing open after a few months, and the contents spill out before the mirror, the reaction of some of these patients is one of genuine horror. Those who have tasted the heady mixture that locks youth into place find it all too addictive, and develop a pathological preoccupation of chasing a desire to become eternally youthful [1]. This obsession with attempting to retard the natural ageing process results in becoming addicted not only to botox but to the unrealistic hope of what botox can actually offer [3].

Two consequences may emerge from this. First, a botox'd population may increasingly perceive wrinkles as signs of ill health. Second, if there are any latent side effects to botox therapy, they are likely to appear in all patients, for few are those who try it and then leave it. Finally, with the current shift of focus from 'rejuvenative' to 'maintenance' therapies we should concomitantly expect an inexorable rise in other, more invasive therapies in a younger adult population. For those with a well-balanced sense of self and social functioning botox can be of psychological benefit. A 'Dorian Gray'-like

syndrome may develop, however, in those for whom botox is a substitute for developing their own coping strategies for happiness and well-being.

References

1. American Psychological Association (1994) Diagnostic and statistical manual of mental disorders. American Psychological Association
2. American Society for Aesthetic Plastic Surgery (2000) Statistics on cosmetic surgery. Available at:<http://www.surgery.org/home.asp>
3. Bradbury E (2002) The perception of ageing. In: Abstracts & biographies presented in Ageing Skin in the New Millenium Conference at The Royal Society of Medicine, London, 11 April
4. Matarasso A, Deva A (2002) Botulinum toxin. *Plast Reconstr Surg* 109:191–1197
5. Matarasso SL (1998) Complications of botulinium A exotoxin for hyperfrontal lines. *Dermatol Surg* 24:1249
6. Rankin M, Borah G (1998) Anxiety disorders in plastic surgery. *Plast Reconstr Surg* 100:525–542
7. Sanders DB, Massey W, Buckley EG (1986) Botulinum toxin for blepharospasm: single-fiber EMG studies. *Neurology* 36:545