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Original Article

Comparative evaluation of botulinum toxin versus iontophoresis with topical aluminium chloride hexahydrate in treatment of palmar hyperhidrosis

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ABSTRACT

Background: Hyperhidrosis is generalised or focal excessive sweating and carries a substantial psychological and social burden. This study compares botulinum toxin versus iontophoresis with topical aluminium chloride hexahydrate in palmar hyperhidrosis.
Methods: The study included 60 cases of palmar hyperhidrosis randomly allocated to 2 groups. One group was given botulinum toxin type A 100 units per palm and the other group subjected to digital iontophoresis with topical application of aluminium chloride hexahydrate lotion for 4 weeks. They were assessed 4 weeks later and those without improvement were crossed over to the other arm for another 4 weeks. Those with improvement were followed up in the same arm for 6 months.
Results: Botulinum therapy showed significant improvement in the initial (80%) as well as cross over cases (75%) as compared to iontophoresis and aluminium chloride (47%) for initial cases and (17%) for cross over cases.
Conclusion: Better improvements were seen with botulinum therapy than with iontophoresis and topical therapy. Residual effects of relief lasted on an average for 4 months for botulinum toxin whereas it was one month with iontophoresis and topical therapy. Advantage with iontophoresis and topical therapy was that it was non invasive and did not require regional anaesthesia as with botulinum therapy.

Introduction

Hyperhidrosis, a condition characterized by excessive sweating can be generalized or focal. Eccrine glands produce a thin, odourless solution hypotonic to plasma resulting in hyperhidrosis if secreted in excess. Generalized hyperhidrosis involves the entire body and usually part of an underlying condition, most often an infectious, endocrine or neurologic disorder. Focal hyperhidrosis is idiopathic, occurring in healthy people. It affects one or more body areas, most often the palms, armpits, soles or face. Almost 3% of the general population, largely people aged between 25 and 64 years,

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experience hyperhidrosis.[1] Palmar and axillary hyperhidrosis have the earliest average onset at about 13 and 19 years respectively. As many as 82% of patients with palmar hyperhidrosis have reported onset in childhood.[2]

Primary Focal Hyperhidrosis should be diagnosed when "focal, visible, excessive sweating of at least 6 months duration" is present without apparent cause with at least two of the following six criteria:[1]

- Bilateral and relatively symmetric distribution
- Impairment of daily activities
- Frequency of at least one episode per week
- Age of onset <25 years
- Positive family history
- Cessation of focal sweating during sleep.

Hyperhidrosis Disease Severity Scale (HDSS)

It is used to assess QOL in patients with excessive sweating. It helps clinicians quickly determine the level of interference with daily activities and to formulate treatment guidelines according to disease severity (Table 1).[3] Some studies have used equivalent grades signifying dry, moist, wet and dripping wet hyperhidrosis corresponding to HDSS scores.[4]

Treatment for primary focal hyperhidrosis aims to reduce the level of sweat secreted to a level that is acceptable to the patient. Various topical antiperspirants like topical anticholinergics, boric acid, 2–5% tannic acid solutions, resorcinol, potassium permanganate, formaldehyde and aluminium chloride have been used.

Iontophoresis involves using direct current to cause a reversible disruption of the ion channel in the secretory glomeruli of the sweat glands thereby reducing the sweat production.

Aluminium chloride has the ability to temporarily close the pores of sweat glands in lower and mid epidermis for several days until it is exfoliated by the physiological regeneration of skin. Application is at night when the exocrine sweat glands are largely inactive; thereby allowing active ingredients to penetrate the skin. Long term treatment results in atrophy of the sweat gland acini.[5]

The sweat glands are anatomically sympathetic and functionally cholinergic. By preventing the exocytosis of acetylcholine, botulinum toxin exerts an inhibitory effect on the cholinergically innervated eccrine secretory cells and reduces sweat production. The injections are painful and topical anaesthetic cream, ethyl chloride liquid spray, cold packs or regional anaesthesia can be used.

The condition carries a substantial psychological and social burden, since it interferes with daily activities. Early detection and management of hyperhidrosis can significantly improve a patient's quality of life. The aim of this study was to compare the efficacy and results of botulinum toxin injections versus digital iontophoresis with topical 20% aluminium chloride hexahydrate lotion therapy in palmar hyperhidrosis.

Table 1 – Hyperhidrosis Disease Severity Scale (HDSS).

Patient complaints	Grades	Scores
My sweating is never noticeable and never interferes with my daily activities	Grade 1 (Dry)	Score 1
My sweating is tolerable but sometimes interferers with my daily activities	Grade 2 (Moist)	Score 2
My sweating is barely tolerable and frequently interferes with my daily activities	Grade 3 (Wet)	Score 3
My sweating is intolerable and always interferes with my daily activities	Grade 4 (Dripping wet)	Score 4

Material and methods

A total of 60 cases of primary focal palmar hyperhidrosis with HDSS scores 3 & 4 were enrolled for the study. They were randomized into 2 groups of 30 each such that each group had equal number of HDSS 4 and HDSS 3 cases (i.e.13 and 17 respectively). Alternate HDSS 3/4 case was allotted either arm of therapy. One group was treated with digital iontophoresis along with topical 20% aluminium chloride hexahydrate lotion overnight application to dry palms and the other group with botulinum toxin.

Inclusion criteria

- Patients with focal primary hyperhidrosis meeting diagnostic criteria
- Ages between 10 yrs and 50 yrs
- Both sexes
- Patients with degree of sweating either HDSS 3 or 4 (Table 1)

Exclusion criteria

- Pregnancy and lactation
- Motor neuron disease
- Amino glycoside antibiotics or with known hypersensitivity to botulinum toxin
- Cases of HDSS 1,2 and cases with generalised and other focal hyperhidrosis

Investigations

- Thyroid function tests
- Blood glucose levels
- Uric acid levels
- Psychiatric assessment if necessary

A Minor's starch iodine test is done for qualitative identification of the areas of excessive sweating over the palms. Iodine solution (1–5%) is applied to a dry surface and after a few seconds starch is sprinkled over this area. The starch and iodine interact in the presence of sweat, leaving purplish sediment, recorded by photographs.[1]

Iontophoresis arm

Iontophoresis using Digital iontophoresis machine was exhibited on a thrice weekly basis using direct current (5–20 mA) both in the forward and reverse direction. Starting at zero, the current was increased slowly till the patient