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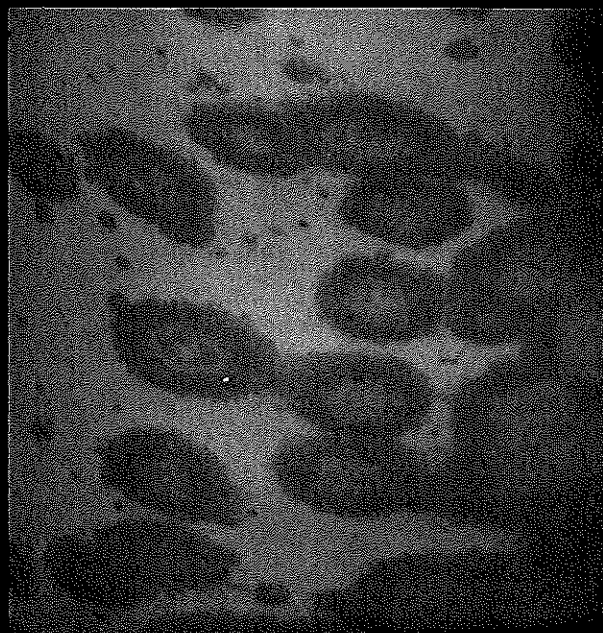
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Hexahydrate in a
Salicylic Acid Gel Base:
A Case Series of
Combination Therapy
With Botulinum Toxin
Type A for Moderate
to Severe Hyperhidrosis**

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Aluminum Chloride Hexahydrate in a Salicylic Acid Gel Base: A Case Series of Combination Therapy With Botulinum Toxin Type A for Moderate to Severe Hyperhidrosis

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Hyperhidrosis is a common condition that has a tremendous impact on the quality of life of patients. For moderate to severe hyperhidrosis, topical aluminum chloride hexahydrate (AC), iontophoresis, and botulinum toxin type A injections are first-line therapies. Botulinum toxin type A has been a useful addition to the hyperhidrosis armamentarium and typically is utilized when topical therapy or iontophoresis have failed. Although highly effective for most patients, there remains a subset of patients who do not completely respond to botulinum toxin type A injections. For these patients, combination therapy with AC can greatly improve patient response. We present a case series of 10 patients with hyperhidrosis and

a history of partial response to botulinum toxin type A monotherapy. With the addition of AC 15% in a salicylic acid 2% gel base, 5 patients achieved 75% to 100% reduction in sweating and 5 patients achieved 100% reduction in sweating. Aluminum chloride hexahydrate in a salicylic acid gel base offers a novel and effective topical therapy in combination with botulinum toxin type A for patients with moderate to severe hyperhidrosis.

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Hyperhidrosis, or sweating beyond physiologic needs, is a common dermatologic condition with a prevalence in the United States of 1%.¹ Treatment options include topical aluminum chloride hexahydrate (AC), iontophoresis, botulinum toxin type A injections, oral anticholinergics, local resection of sweat glands, and endoscopic sympathectomy.¹⁻³ OnabotulinumtoxinA is another treatment option approved for axillary hyperhidrosis in the United States. The hyperhidrosis disease severity scale (HDSS) is a 4-point scale that measures hyperhidrosis severity based on its impact on daily activities (1=my sweating is never noticeable and never interferes with my daily activities; 2=my sweating is tolerable but sometimes interferes with my daily activities; 3=my sweating is barely tolerable and frequently interferes with my daily activities; 4=my sweating is intolerable and

always interferes with my daily activities). Solish et al³ discussed therapies for hyperhidrosis using an evidence-based approach. Topical AC either in absolute ethanol or in salicylic acid gel is considered first-line therapy for patients with an HDSS score of 2. The mechanism of action is via aluminum salt blockage of the distal acrosyringium, which leads to functional and structural degeneration of the eccrine acini.^{4,5} For patients with an HDSS score of 3 or 4, topical AC, iontophoresis, and botulinum toxin type A injections are first-line therapies. These agents can be used alone or in combination with other treatments. We present a case series of 10 patients with hyperhidrosis who were treated with combination therapy (botulinum toxin type A in addition to AC 15% in a salicylic acid 2% gel base).

Case Series

Ten patients with hyperhidrosis and a history of partial response to botulinum toxin monotherapy were included in this case series. Patients who had hyperhidrosis and were not 75% to 100% responsive to

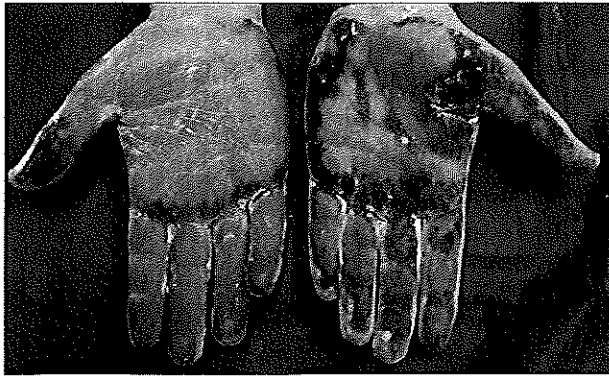
botulinum toxin type A therapy were included. Patients meeting these criteria seen during a 4-month period were included in this series. All patients agreed to complete a survey administered via telephone.

The patients were aged 19 to 46 years with moderate to severe hyperhidrosis on the axilla, hands, or feet. Topical AC monotherapy had previously failed for all of the patients in this series. Aluminum chloride hexahydrate 15% in a salicylic acid 2% gel base was added to their botulinum toxin treatment regimen. Patients were injected with botulinum toxin type A and then started on AC gel. The patients were instructed to use AC gel nightly for 7 nights and then as needed. Their response to the combination was assessed by a survey administered by telephone 4 weeks later in which patients were asked to rate their improvement on a scale ranging from 0% to 100%. With the addition of AC 15% in a salicylic acid 2% gel base, all patients achieved 75% to 100% improvement in their hyperhidrosis (Table). None of the patients reported any notable irritation.

Case Summaries

Case No.	Age, y	Fitzpatrick Skin Type	Location of Hyperhidrosis	Reduction in Sweating ^a
1	26	III	Axillae	75%–100%
2	29	V	Axillae	100%
3	35	II	Axillae	100%
4	32	III	Hands	75%–100%
5	19	II	Axillae	75%–100%
6	46	V	Axillae	100%
7	26	II	Feet	75%–100%
8	37	III	Hands	100%
9	28	VI	Hands	75%–100%
10	28	V	Axilla	100%

^aReduction in sweating achieved with the combination of aluminum chloride hexahydrate 15% in a salicylic acid 2% gel base and botulinum toxin type A.



Reduction in sweating achieved with combination therapy of botulinum toxin type A and aluminum chloride hexahydrate 15% in a salicylic acid 2% gel base (right hand) compared to botulinum toxin type A alone (left hand).

Comment

Botulinum toxin type A has been a useful addition to the hyperhidrosis armamentarium and typically is utilized when topical therapy or iontophoresis have failed. Although highly effective for most patients, there remains a subset of patients who do not completely respond to botulinum toxin type A injections. Suboptimal response and breakthrough sweating before the next scheduled treatment can occur in any location and is most common when treating the hands and feet. These limitations of botulinum toxin type A easily can be addressed with combination therapy. The Figure demonstrates the considerable reduction in sweating achieved with combination therapy of botulinum toxin type A and AC 15% in a salicylic acid 2% gel base (right hand) compared to botulinum toxin type A alone (left hand).

Combination therapy with botulinum toxin type A and topical AC may have been underutilized in the past due to concerns of irritation with topical AC.³ Most commercially available formulations are alcohol solutions with concentrations ranging from 6% to 20%. Lower concentrations are better tolerated but less effective. Compounded formulations of up to 50% have been utilized to improve efficacy at the expense of patient tolerability. The anhydrous alcohol vehicle of the solution appears to substantially contribute to irritation with topical AC.³

Aluminum chloride hexahydrate in a salicylic acid gel base appears to offer improved tolerability without compromising efficacy. There are many possible reasons for improved tolerability and efficacy with this formula. The gel formulation may improve tolerability by hydrating and mitigating the drying effect compared to an alcohol solution.⁶ Enhanced absorption of AC also may occur due to the keratolytic

properties of salicylic acid. In addition, salicylic acid could have a synergistic effect with AC because of its astringent and antiperspirant properties.^{6,8}

Combination therapy with AC 15% in a salicylic acid 2% gel base and botulinum toxin type A appears to be well-tolerated and efficacious in patients with moderate to severe hyperhidrosis. All 10 patients in this series had persistent sweating after treatment with botulinum toxin type A as monotherapy. With the addition of AC 15% in a salicylic acid 2% gel base, 5 patients achieved 75% to 100% reduction in sweating and 5 patients achieved 100% reduction in sweating.

Conclusion

Combination therapy with AC 15% in a salicylic acid 2% gel base should be considered in patients with a less than optimal response to botulinum toxin type A monotherapy. In addition, this combination therapy can be useful in any patient treated with botulinum toxin type A for breakthrough sweating at the end of the treatment cycle. Aluminum chloride hexahydrate in a salicylic acid gel base offers a novel and effective topical therapy in combination with botulinum toxin type A for patients with moderate to severe hyperhidrosis.

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