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Can it make me white again? A case report of 88% phenol as a depigmenting agent in vitiligo

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Abstract

Vitiligo is the most common depigmenting disorder. However, therapies prove to be time-consuming, costly, or slow to show efficacy. Here, we present a case of a 74-year-old female with vitiligo who underwent full-body depigmentation treatment 50 years ago. Brown patches of repigmentation appeared on the patient's face and arms and were eventually treated with 88% phenol. Patient was later switched to compounded 3% glutathione cream for a more sustained effect. Phenol was an accessible, economical, and easily administrable therapeutic option that can result in short-term depigmentation.

Keywords

Case report, vitiligo, 88% phenol, depigmentation therapy, depigmentation agents

Introduction

Vitiligo is the most common depigmenting disorder, affecting up to 1% of the world's population.[1] This acquired autoimmune disorder typically presents as white patches with distinct margins. Different subtypes of vitiligo such as generalized, acrofacial, and universalis may be widely distributed on the body, recalcitrant to therapy, and cosmetically disfiguring.[1,2] Depigmenting therapies are employed in cases of diffuse, but incomplete, vitiligo to help standardize appearance by whitening patches of residual pigmented skin. Common depigmenting therapies include monobenzone ethyl ester of hydroquinone (MBEH), laser resurfacing, and even cryotherapy.[1,2,3] However, these therapies prove to be costly and painful when used over a large body surface area (BSA).[3] Phenol in 88% concentration is an effective, seldom reported depigmenting agent for residual pigmentation in patients with vitiligo. There are reports of its use in South America and Asia to treat vitiligo,[4,5] though there are no reports from North America. We present a case of partially repigmented vitiligo, which was treated with 88% phenol for depigmentation. This therapy is an accessible, economical, and easily administered option that induces short-term depigmentation.

Case report

A 74-year-old, white-appearing, ethnically Indian female presented to the dermatologist with concern over her pigmentation change. She had been diagnosed with vitiligo in her third decade of life and its extent led to treatment with benoquin for full-body depigmentation in South Africa. The depigmentation therapy resulted in uniformly white skin for the next 50 years. In 2019, the patient noted brown patches of repigmentation and became extremely distressed, prompting her to seek dermatologic attention. At consultation, the patient displayed brown macules encompassing ~10% BSA with adjacent patches of depigmentation involving the face and arms. She expressed psychological trauma due to the unexpected repigmentation. Commercially available camouflage therapies were discussed; however, the patient sought a more enduring prescription therapy.

Therapeutic depigmentation with topical MBEH then benoquin (4 months each) were attempted, followed by three sessions of cryotherapy without clinical success. Laser therapy with q-switched ruby or alexandrite lasers were considered, but the patient was unable to afford these or acquire it on a compassionate basis.

After a review of the academic literature and consulting with a local compounding pharmacy, topical application of

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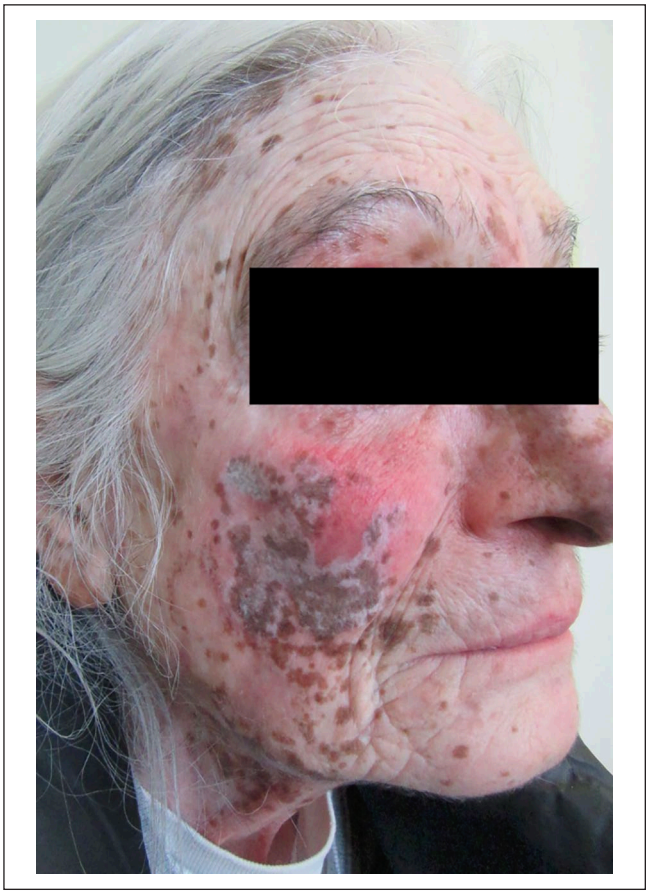

Figure 1. Brown macules with adjacent patches of depigmentation involving the face in a patient with vitiligo. Frosted appearance upon post-application of 88% phenol on the face at sites of repigmentation. Face was rinsed with isopropyl alcohol three times prior to phenol application. Picture was taken after patient's consent.

88% phenol was enlisted as therapy. The patient's face was triple-rinsed with isopropyl alcohol, then phenol solution was applied with a cotton-tipped applicator to areas of brown repigmentation. The compound exhibited a frosted appearance and was washed off in-clinic with syndet cleanser and water (Figure 1). To mitigate irritation, therapy with desonide cream was used nightly for 1 week. She reported effective depigmentation lasting 2 weeks after each application. Scheduled applications were interrupted due to the COVID-19 pandemic but resumed and were generally repeated in-office monthly. Serial photography revealed modest improvement of the skin over the face (Figure 2), which the patient initially deemed cosmetically acceptable. Ultimately, phenol therapy was discontinued after three sessions because the patient sought therapy that would provide more sustained depigmentation results. She was prescribed compounded 3% glutathione cream for daily use with reassessment planned for 3 months.

Discussion

This elderly female with severe repigmenting vitiligo underwent serial 88% phenol treatments for depigmentation of residual pigmented skin with good therapeutic tolerance and reasonable, but unsustained, clinical efficacy.

Phenol passively absorbs into the skin due to its lipophilic properties and interferes with melanogenesis, incapacitating melanocytes from adequately synthesizing melanin, and induces epidermal protein coagulation.[3,4,6–9] In facial peels, phenol induces epidermal regeneration by forming adnexal keratinocyte and elastic fibres and increasing diameters of dermal collagen.[8,9]

In clinical practice, 88% phenol is highly accessible and economically advantageous compared to MBEH, a commonly used topical depigmenting agent. This compound is easily accessed and costs around CDN$35 for 100 mL. In comparison, the estimated cost for the same volume of compounded MBEH 20% is around CDN$200. Furthermore, therapy with ruby laser costs approximately CDN$200 for every 2–3 laser pulses, with each pulse depigmenting around 1.5 cm of skin.

In addition to its affordability and accessibility, 88% phenol has previously been used as a depigmenting agent with minimal complications and reasonable results.[3,4,5,6] Zanini[4] presented a 62-year-old female with generalized vitiligo, and residual normochromic patches in the anterior cervical region lasting 8 years. The patient was treated with 88% phenol for two sessions, 45 days apart, which eliminated the residual pigmented skin. Depigmentation persisted after an 18-month follow-up without significant complications.

Kavuossi[5] also described a 13-year-old male with a 5-year history of vitiligo with macules and normally pigmented skin on the right periorbital area. Eventually, co-therapy of phenol 88% and liquid nitrogen cryotherapy led to complete depigmentation of the patient's macules in 6 months without further complications. Cryotherapy (liquid N_2) is a cost-effective therapy that can induce rapid permanent depigmentation in vitiligo over a limited area at a time[5,7] without requiring anaesthesia. Its use in combination with 88% phenol is likely to be efficient, effective, and accessible with minimal immediate complications of edema, pain, and bulla formation.[5,7]

Although topical phenol is well tolerated in vitiligo, systemic ingestion of phenol between 8 and 15 g has been shown to result in a range of morbidities including cardiac arrhythmia, respiratory failure, clonic convulsions, organ failure, and even death.[9,10,11] In clinic, 88% phenol concentration can be applied to the skin in small volumes and areas (e.g. 5 mL; ~20% of the face-neck region),[4] at 4- to 6-week intervals for an extended duration. This protocol prevents the occurrence of serious complications. After application of 88% phenol, an antibiotic ointment and low-potency topical steroid along with sunscreen can be applied to help limit inflammation and dyspigmentation due to ultraviolet radiation (UVR) exposure.[4,5,6]

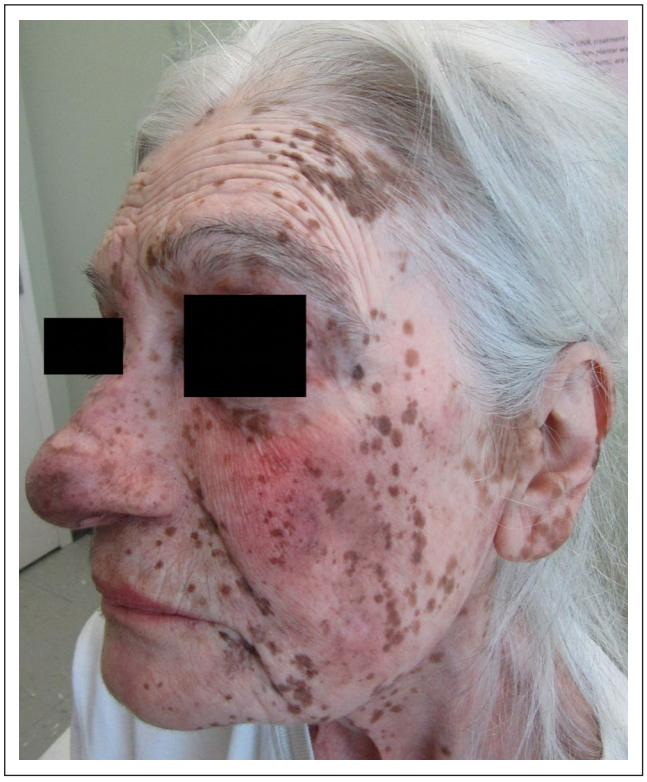

Figure 2. Mid-left cheek responded to 88% phenol with fading of brown repigmentation in early 2020. Modest improvements were observed on skin over the face. The nasal bridge was treated with cryotherapy in 2019; sustained depigmentation can be observed. Picture was taken after patient's consent.

Paradoxically, phenol itself can have a counter-effect and may induce pigmentation in vitiligo,[12] likely due to UVR-induced melanocyte activation, melanogenesis at the basal layer, and/or post-inflammatory hyperpigmentation.[4,12,13] This action may have occurred in this patient towards the end of her interval, just before phenol reapplications.

Our patient also presented with psychological trauma due to unexpected repigmentation after previously having 'lived life as a white woman'. Psychological disorders occur in 75% of patients with vitiligo, most prevalently depression, due to perceived cosmetic disfigurement, unpredictable disease clinical course, and lack of predictably effective treatments.[14] Psychological stressors, mood disturbances, self-perceived stigmatization, low self-esteem, self-image, and self-worth are also strongly associated with vitiligo.[14] Female sex and cultures with negative connotations towards vitiligo are strong intersectional factors; the appearance of vitiligo can threaten one's ethnic and cultural identities.[14]

Phenol is a potential depigmenting therapy due to its availability, affordability, and ease of application. However, 88% phenol may not produce a sustained effect and may warrant co-therapy with liquid nitrogen or adjuvant topical therapy, similar to this case. As an under-utilized therapy in North America, its application deserves consideration and can help reduce repigmented vitiligo.

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Informed consent

Informed consent was obtained from the patient.

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