

Brothers Who Burn: Two Paediatric Case Reports of para-Phenylenediamine (PPD) Sensitisation to Black Henna

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Background

- The addition of PPD to red henna to create *temporary black henna tattoos (TBHT)* is popular in tourist industries globally.
- A literature search using Medline and PubMed discovered 11 and 113 articles respectively, all of which were single or multiple case series. These demonstrated an increasing prevalence of this issue in western societies.
- Hypopigmentation, keloid formation, permanent scarring, and recurrent burns can occur when exposed to associated compounds (in patients with a delayed type IV hypersensitivity reaction).¹
- Type I hypersensitivity reactions (urticaria, angioedema, or anaphylaxis) with potentially lethal reactions have also been documented.

Case Series

- 2 previously well brothers, aged 5 and 10 years, presented with 4-5% TBSA superficial dermal burns following the application of TBHT in Bali.
- Referred to Outpatient Burns Clinic for management of their erythematous, pruritic, papulovesicular superficial burns.
- The first application of TBHT triggered no reaction (areas least affected). Sequential application 10 days later triggered severe inflammatory reactions within 24-48hours of application, as shown in photographs .
- Management consisted initially of Hydrogel, paraffin gauze and oral antibiotics, followed by anti-microbial foam and Nanocrystalline silver dressings, and finally, topical steroid cream.
- Dermatology advised avoiding chemicals with cross-reactivity*, in addition to PPD-containing products.
- Hypopigmentation of burn scars remains present >30 days after initial injury, with a significant risk of cosmetic and long term psychosocial complications for these boys.

10 year old



5 year old



Discussion

- This product remains legal in Australia.
- Sequelae of ingestion can include: angioneurotic oedema, anaphylaxis, acute renal failure and death (13/31 children died <24hours of ingestion in case series published in Sudan)²
- In Australia, the burden of disease is low, but exposure is difficult to control. Public awareness and prevention is likely the most effective method to reduce prevalence of this disease.
- Areas of research into long term management of hypopigmentation include: melanocyte-keratinocyte transplantation procedure, initiation of melanogenesis with ectopic synthetic analogues of α -MSH, or using topical Tacrolimus (FK506) to initiate melanogenesis?³

*oxidative dye components (eg. p-toluenediamine, p-aminodiphenylamine, 2,4-diaminoanisole, o-aminophenol, 1,4-benzenediamine, p-aminoaniline), black and white photographic developers, clothing dyes, technical rubber antioxidants (N-izopropyl-N-fenyl-p-fenylodiamin), epoxy resin hardeners, sulphonamides, and local anesthetic drugs (caines).(encabo)

References

1. Mukkanna, KS; Stone, NM; Ingram, JR, PPD allergy: current perspectives on diagnosis and management. *Journal of Asthma and Allergy*, 2017;10(1):9-15
2. Sir Hashim M, Hamza YO, Yahia B, Khogali FM, Sulieman GI. Poisoning from henna dye and para-phenylenediamine mixtures in children in Khartoum. *Annals of Tropical Paediatrics*. 1992;12(1):3-6
3. . Carney BC, McKesey JP, Rosenthal DS, Shupp JW. Treatment strategies for hypopigmentation in the context of burn hypertrophic scars. *Plastic and Reconstructive Surgery Global Open*. 2018;6(1):e1642.

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