A “Natural” Dermatitis: Contact Allergy to Tea Tree Oil

Yvette Miller Monthrope, B.Sc. (OT5)
James C. Shaw, M.D., FRCPC

Abstract
Allergic contact dermatitis to tea tree oil is a well-documented phenomenon. The past two decades have shown an increased demand for the use of natural products to treat a variety of skin conditions. It is therefore important to recognize that severe contact allergies may occur as a result of their use. We present the case of a 50 year-old animal researcher with a nine-year history of large, painful, red lesions occurring on her face and neck. Multiple antimicrobial agents had been tried with no effect on her symptoms. After careful review of her history, it was determined that the patient had been using Australian tea tree oil for a number of skin conditions including acne and athlete's foot. Allergic contact dermatitis to tea tree oil was suspected and later proven by a usage test. At a six-month follow-up, the patient had stopped using the tea tree oil and had no more lesions. This case demonstrates the importance of inquiring about the use of natural products or medications in a complete medical history. It also demonstrates that contact dermatitis can take on a variety of forms even mimicking lesions generally thought to be infectious in origin.

Case
A 50-year-old female presented to the dermatology clinic with a pruritic and painful skin eruption localized to her right cheek. Multiple dermatologists had seen her over a period of nine years for similar eruptions appearing on her face and neck. She had been working in the field of animal research for over 20 years and initially her lesions were thought to be of zoonotic or fungal origin. Multiple skin scrapings yielded negative results, and antifungal creams had no effect. Impetigo and herpes simplex infection (HSV) were also considered in the differential for her symptoms. As a result she was managed with antibiotic creams, and one course of Acyclovir, which did not alleviate her symptoms. The patient was otherwise healthy, had no recent travel history, and there had been no changes to any of the products used on her skin.

On examination, the patient was stable and displayed no signs of systemic disease. Her right medial cheek displayed a 2 x 1.5 cm well-demarcated erythematous, annular plaque (Figure 1). Some yellow crust was noted overlying much of the lesion. Viral and bacterial cultures were taken to rule out HSV and impetigo. The patient was started on Acyclovir 400 t.i.d. and Fucidin ointment daily. Upon returning to the clinic the following week, her symptoms had not improved, her viral and bacterial cultures were negative and the lesion had increased in size. Further exploration at this time revealed that the patient had been using Australian tea tree oil for greater than ten years over multiple areas of her body including her face. She had been applying the oil daily to her right cheek.
hydrocarbons and their alcohols. Currently, Australia is the only components, the majority being monoterpene and sesquiterpene Tea tree oil is an essential, steam distilled oil from the foliage of the patient returned to clinic two days later with a large ill-defined erythema- tous eruption on the back of her neck associated with severe pain and pruritus (Figure 2) where the tea tree oil had been applied. The clobetasol cream had helped to settle the lesion on the right cheek. A clinical diagnosis of allergic contact dermatitis to tea tree oil was made and the patient was followed up in clinic one month later with no more lesions.

Two months following her initial visit, the patient presented to clinic with painful, oozing lesions in her mouth. Her history revealed that she had started using a new toothpaste. Upon examination of its contents, it was determined that the toothpaste con- tained a small amount of tea tree oil. Follow-up at six months after the initial presentation showed that the patient had been careful to avoid contact with tea tree oil containing products; since this time she has been free of similar lesions.

Comment

Tea tree oil is an essential, steam distilled oil from the foliage of the Australian tea tree, *Melaleuca Alternifolia*, a particular species of the Myrtaceae family. It is a complex mixture of over 100 different components, the majority being monoterpenes and sesquiterpenes hydrocarbons and their alcohols. Currently, Australia is the only country that produces tea tree oil commercially. Although it has been used for over 75 years, the 1980s began an era of mass production of the product to meet a growing demand for natural remedies and cosmetics. As a result, tea tree oil has become a popular non-prescription medication used to treat a variety of conditions such as acne, warts, fungus, bacterial infections, lice, dandruff, and even psoriasis. Today, due to such increasing demand for “natural” products, the massage and aromatherapy industry readily use the oil, and traces of the substance are commonly found in a number of household products including mouthwash- es, toothpastes, cosmetics, laundry detergents and fabric softeners. Contact dermatitis is an inflammatory cutaneous reaction following the skin’s exposure to various external agents. It can be subdivided into two forms: irritant contact dermatitis and allergic contact dermatitis. Allergic contact dermatitis (ACD) is the less common of the two and is responsible for approximately 20% of all contact dermatitis reactions. ACD is a delayed cell-mediated type IV hypersensitivity reaction, which involves contact of the skin with a small hapten antigen. On initial exposure, Langerhan cells found in the epidermis become associated with this hapten molecule initiating a T-cell mediated immune response, which takes between 5 and 20 days. Upon re-exposure to the same antigen, a much faster response occurs due to proliferation of active T cells. At this point a dermatitic or eczematous eruption will occur at the site of contact.

Allergic contact dermatitis to tea tree oil is a well-documented phenomenon and has been described in several reports since the early 1990’s. The first was reported in the Australian Journal of Dermatology in 1991. Soon after, a paper by Degroot and Weyland described a generalized contact dermatitis after the ingestion of tea tree oil. Numerous cases since these early reports have been described in the literature. These publications emphasize the diversity in presentation of this dermatitis as well as the possibility of associated secondary dermatological conditions. Sasseville et al. described a case of ACD to tea tree oil with a subsequent erythema multiforme-like id reaction, and more recently a case of tea tree oil dermatitis associated with linear IgA disease was described in the United Kingdom by Perrett. We present the case of a 50 year-old animal researcher, whose ACD to tea tree oil was not discovered until almost 10 years after the first lesion appeared. Her clinical presentation did not appear to be dermatitic in origin but rather suggested an infectious process, which further calls attention to the diversity in presentation of this dermatitis.

Efforts have been made to determine the constituents of tea tree oil most responsible for sensitization. Aromadendrene, α-terpinine, δ-limonene, and eucalyptol have been all been suggested as pri- mary sensitizers. Other reports have recently indicated that tea tree oil exposed to light or heat undergoes rapid oxidation, and hence increases the sensitivity of the product. This may have occurred in our patient.

We bring this case forth to highlight the importance of specifical- ly asking about the use of natural products. For almost ten years, our patient had never mentioned the use of tea tree oil, as she believed it was “natural” and could do her no harm. With the growing use of natural oils and products in society, and the increasing number of reports documenting sensitization to their usage, it is essential to question all patients about the use of tea tree oil as well as other natural remedies.

References

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