CASE REPORT

Elaioconiosis (Hydrocarbon-induced acne): A case report

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ABSTRACT

Elaioconiosis, also known as occupational acne venenata (hydrocarbon acne), is an acneiform dermatosis secondary to chronic cutaneous exposure to mineral oils and petroleum derivatives. It is considered the most common occupational acne worldwide.[1,2] We report the case of a 44-year-old male with controlled diabetes mellitus who presented with pruritic acneiform lesions on forearms and legs associated with chronic occupational diesel exposure. Diagnosis was clinical and supported by dermoscopy. Treatment with topical retinoids and 10% urea resulted in significant improvement after 10 weeks. Early recognition and preventive measures are essential for resolution.

INTRODUCTION

Elaioconiosis, also known as hydrocarbon acne, Brooke's keratosis follicularis, or occupational acne venenata, was first described by Purdon in 1867 in workers responsible for cleaning and lubricating loom spools.[1] It is considered the second most common cause of occupational dermatoses worldwide and the most frequent form of occupational acne.[2,3]

It is an acneiform dermatosis caused by chronic cutaneous exposure to chemical substances such as antioxidants, lubricants, coolants, and mineral oils such as diesel. Its main cause predominantly affects individuals working professionally as industrial mechanics in mechanical workshops, automotive lubrication centers, and metal industry workers who do not use personal protective equipment (PPE), wear contaminated clothing for prolonged periods, or maintain poor hygiene habits.[3,4]

Its incidence is not well established, as most cases are not statistically reported, and it tends to be more frequent in men than in women due to occupational exposure patterns.[4,5]

Clinically, this condition is generally symmetrical, affecting body follicles with open comedones, papules, pustules, and nodules that may leave visible scars upon resolution, often accompanied by pain and pruritus. These lesions are usually located on the extensor surfaces of the forearms, abdomen, and the anterior and lateral regions of the thighs and legs, where prolonged contact with clothing impregnated with the associated agents commonly occurs.[1,5]

PATHOPHYSIOLOGY

The pathophysiological mechanism of elaioconiosis is believed to be related to the exogenous mechanical and chemical obstruction of the pilosebaceous duct by the products used, along with their hyperkeratotic effects on the follicular epithelium. This process leads to comedone formation and triggers a follicular inflammatory response by releasing IL-1, TNF-α, and IL-8. Subsequently, sebaceous secretion retention occurs, which may be accompanied by Staphylococcus proliferation as a secondary infection.[3,4] Figure 1.

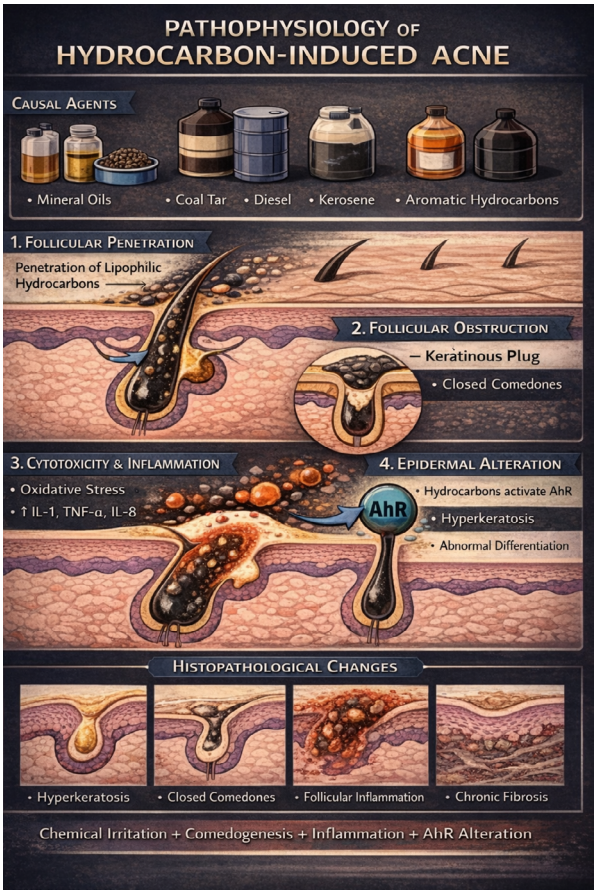


Figure 1: Schematic representation of the pathophysiology of elaioconiosis. Image generated using artificial intelligence.

Histologically, hyperkeratosis of the follicular epithelium, dilation of the infundibulum with abundant compact keratin, inflammatory infiltrate in the dermis, and the presence of atrophic sebaceous glands replaced by horny cysts (in contrast to acne vulgaris) have been reported.[4,5]

Diagnosis is based on clinical findings, occupational history, and the location of lesions in areas exposed to these chemical substances.[1,6]

The main differential diagnosis is chloracne, an acne-like cutaneous disorder caused by systemic exposure (inhalation or ingestion) to halogenated hydrocarbons, which primarily affects the face, particularly the mandibular angles and retroauricular region, while sparing the nose.[5,6]

TREATMENT

Management includes topical retinoids such as 0.05% retinoic acid; keratolytic agents such as Vleminckx's solution, 5% benzoyl peroxide, 3% salicylic acid, and 10–20% urea. In the presence of inflammatory lesions, short-term topical corticosteroids may be used. In moderate to severe cases, systemic tetracyclines may be considered due to their immunomodulatory effects on inflammatory cell chemotaxis, with doxycycline at 50 mg/day orally for 8 to 12 weeks being a therapeutic option. In recalcitrant or severe cases, isotretinoin at 0.5 mg/kg/day for 12 weeks represents another alternative, depending on disease severity.[2,5,6]

The cornerstone for resolution of this condition lies in preventive measures, including the use of personal protective equipment (PPE) such as industrial clothing, gloves, and masks during working hours to avoid exposure to chemical substances, as well as adequate hygiene following chemical exposure.[1,3]

CLINICAL CASE

A 44-year-old male with a history of well-controlled diabetes mellitus and Fitzpatrick skin phototype IV presented with an 8-month history of an acneiform eruption characterized by open comedones and pigmented keratotic follicular papules associated with intense pruritus and worsening after sun exposure.

The lesions were located on both forearms and the anterior aspect of the legs. Dermoscopic examination revealed multiple perifollicular papules with dark pigmentation corresponding to post-inflammatory hyperpigmentation, monomorphic lesions, and follicular openings (Figure 2).

The patient reported chronic occupational exposure to diesel due to work-related activities.

Based on the clinical presentation and occupational history, a diagnosis of elaioconiosis was established. Treatment consisting of urea 10% twice daily and topical retinoids 0.05% applied nightly was initiated, along with patient education regarding preventive measures and the use of personal protective equipment (PPE). Significant clinical improvement was observed after 10 weeks of treatment.

CONCLUSIONS

Elaioconiosis is an underdiagnosed condition that should be suspected in the presence of acneiform lesions located in non-seborrheic areas in patients with occupational exposure to hydrocarbons.[1,2] Treatment includes topical retinoids, keratolytic agents, and, in selected cases, systemic antibiotics or isotretinoin.[5,6] Early recognition and preventive intervention remain the cornerstone of therapy.[3]

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Figure 2: A. Hyperpigmented follicular papules are observed. B. Papules with monomorphic follicular openings.