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Skin Change Secondary to Accidental Crude Oil Exposure

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SUMMARY:

This report is based on nine family members who were accidentally contaminated by crude oil while swimming in the Red Sea. The oil was spilled by a tanker which struck a coral reef.

Pruritic papules, plaques and granulomatous lesions developed. These lesions were replaced by black head comedones. Residual scars resulted after Tretinoin cream was used to treat the acne. There was no recurrence after 10 months of treatment.

To my knowledge this is the first report describing skin changes in non-occupational accidental crude-oil exposure. The evolution of skin changes, treatment and course of the eruption is described.

The repeated accidental spilling of crude oil into oceans and bodies of water is increasing. The Alaskan oil spill and the Gulf war oil spill were the most recent devastating events[1].

Descriptions of skin changes after exposure to crude oil is lacking in the literature and in the major textbooks of Dermatology. Only the acnigenic affect of crude oil on workers in oil fields and refineries is mentioned[2,3]. Detailed descriptions of the different types, sites and courses of acne is also lacking in the literature. This is a report of a family, describing the consequences of their cutaneous changes after they swam in a crude oil contaminated area, spilled by an oil tanker which struck a coral reef in the Red Sea.

The report should alert physicians to the possible health threat from accidental chemical exposure, especially since the incidence of these accidents is increasing today. This emphasizes that acne is a good marker of poisoning, secondary to external chemicals.

Case Report

A family of nine, seven children and their parents were referred to the Dermatology Clinic at King Abdulaziz University Hospital in 1989. They were complaining of semi generalized pruritic skin lesions involving the face, extremities and lateral parts of the trunk. The problem started three months previously when their eight-year-old daughter complained of an erythematous maculopapular lesion with fever and vague abdominal pain. A viral infection with exanthem was thought to be the cause as no other abnormalities could be found. She was treated symptomatically.

Two weeks later, the other children started to have similar complaints and eventually the whole family was involved. Re-examination at

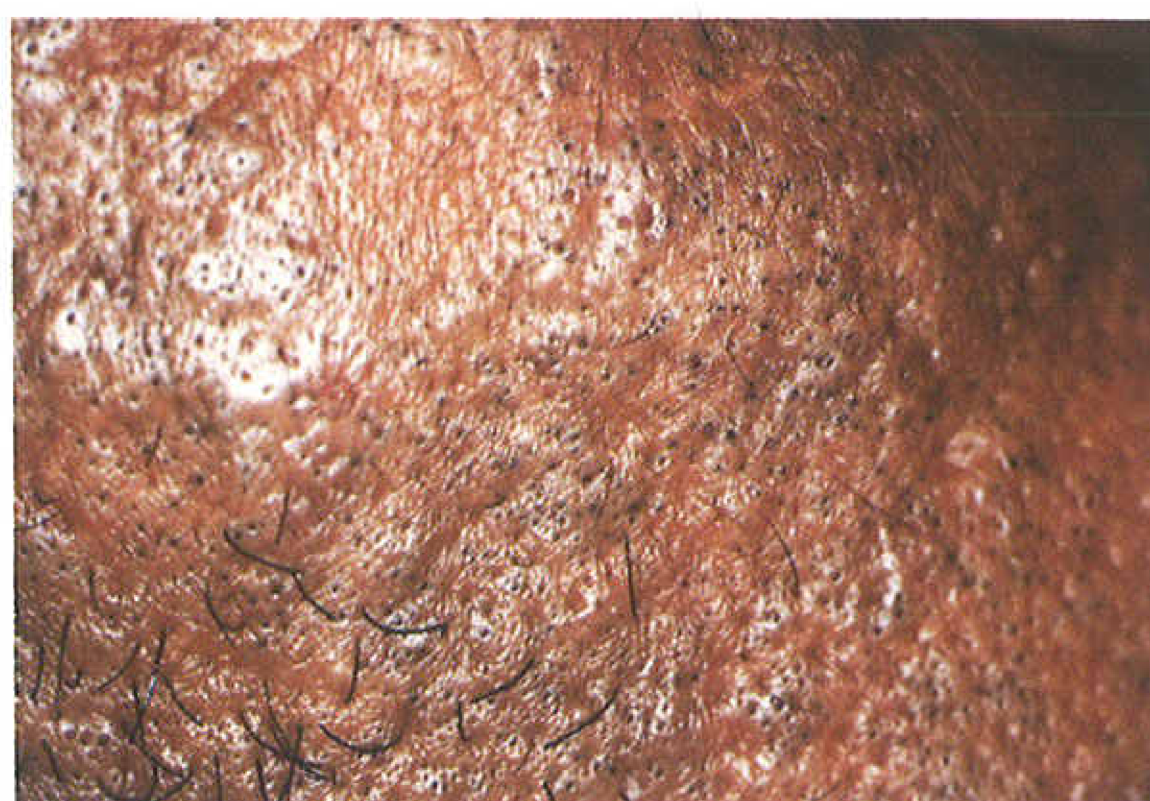
their neighbouring Dermatology Clinic showed mainly erythematous papules with scratch marks on extremities, face and trunk with some lesions showing Koebner phenomenon. Laboratory investigations showed normal complete blood counts, ESR, Renal and liver functions tests, and electrolytes were also normal. Hepatitis B virus antigen, and Coxsackie serology were negative. Skin biopsies showed hyperkeratosis and acanthosis with a foreign body type of granuloma. A definite diagnosis was not possible and the patients were treated symptomatically. They were given antihistamine, calamine lotion and steroid cream. The patients experienced mild improvement and were referred to us for further investigation and management.

On physical examination, in our clinic, erythematous scaly papules 2-4 mm in diameter, coalesced to form large patches on the face, trunk and extremities. Some lesions were lichenified and others were involving the hair follicles. The lesions were very itchy and the children could not stand still to be photographed. The youngest daughter, at the age of two, had an arciform raised erythematous, granuloma annulare-like lesion over the knuckles on the hands and legs. One child had enlarged cervical lymph nodes. The whole family was otherwise healthy and no other abnormalities were found.

The detailed history failed to reveal any other significant information and the review of systems, past medical history and family history were normal. The family lives in Baharah, a small village between Jeddah and Makkah. The father works as a vegetable vendor. He quit farming seven years ago. The mother is a housewife and the children attend school in their village. No travelling history was found, and no habits or hobbies are known. There has been no report of any similar skin condition in their village.

Two skin biopsies were done, one from the papules and the other from the granuloma. Both specimens showed a more or less identical appearance. There is a foreign body granulomatous reaction made up of lymphocytes, plasma cells, macrophages, and eosinophils with formation of foreign body giant cells. The granulomatous infiltration is seen mainly around the hair follicles. Stains for fungus were negative. The exact nature of the granulomatous inflammation could not be determined.

The patients continued the same treatment as mentioned previously and two weeks later the itching resolved completely and the papules were disappearing. On a re-visit two weeks later, lesions were replaced by black heads and comedones in the same body sites (Figs. 1,2).



Exposure to environmental acnigenic chemicals as halogen and chlorinated hydrocarbons was thought to be the cause. Upon further investigation and questioning of

the parents, they denied any chemical exposure in the form of pesticides, drugs or paints. No changes took place at home i.e. renovations, building or painting.

When questioned further about their travelling history, the father recalled visiting Jeddah, 45km away from their vilage during the holiday season. He recalled swimming in the Red Sea, in a contaminated area where their bodies became greasy.

During this period an oil tanker struck a coral reef where a large amount of crude oil was spilled. A decontamination and clean up operation was carried out immediately and promptly. However, some of the oil did in fact reach Jeddah.

Discussions

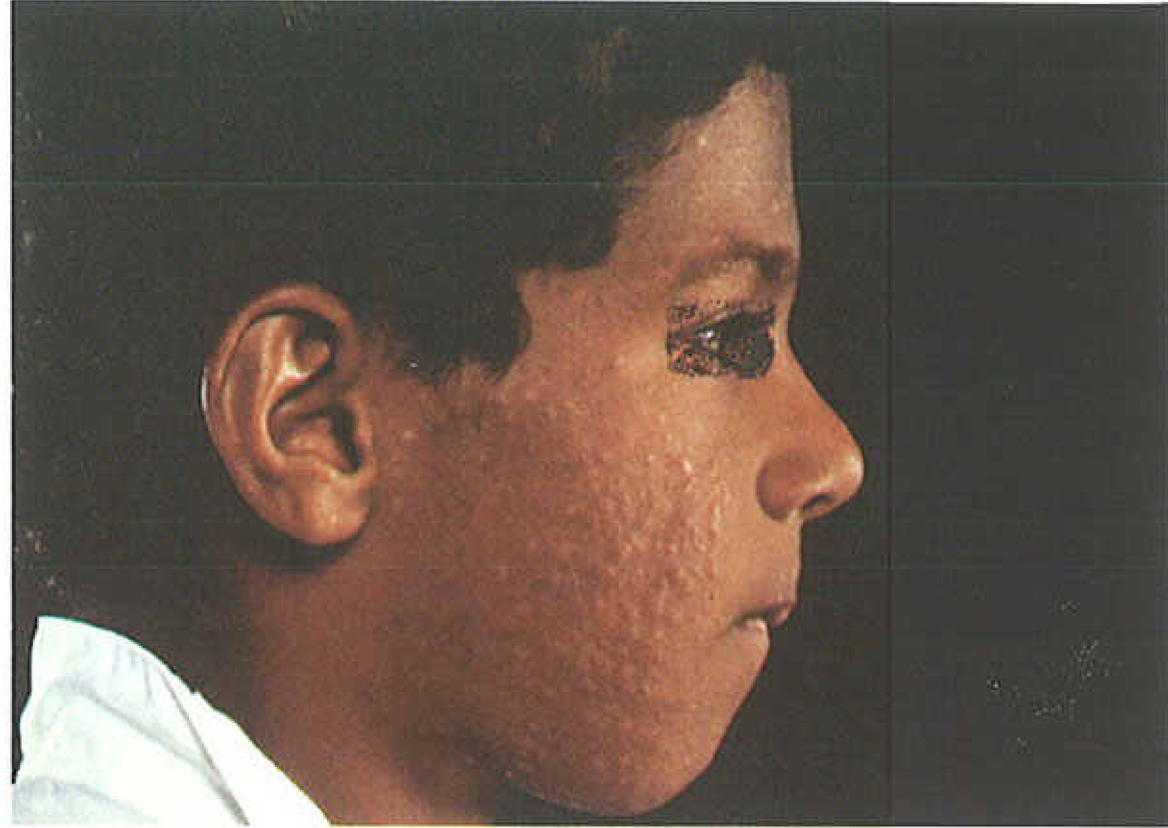
This family confronted us with a difficult diagnostic problem at the initial presentation. The two different morphologic changes and the "contagious" involvement of the whole family did not fit a definite diagnosis. The parents ,denial to external exposure of any nature, as they could not link swimming in a contaminated sea with the skin problem added to our difficulty in obtaining a diagnosis.

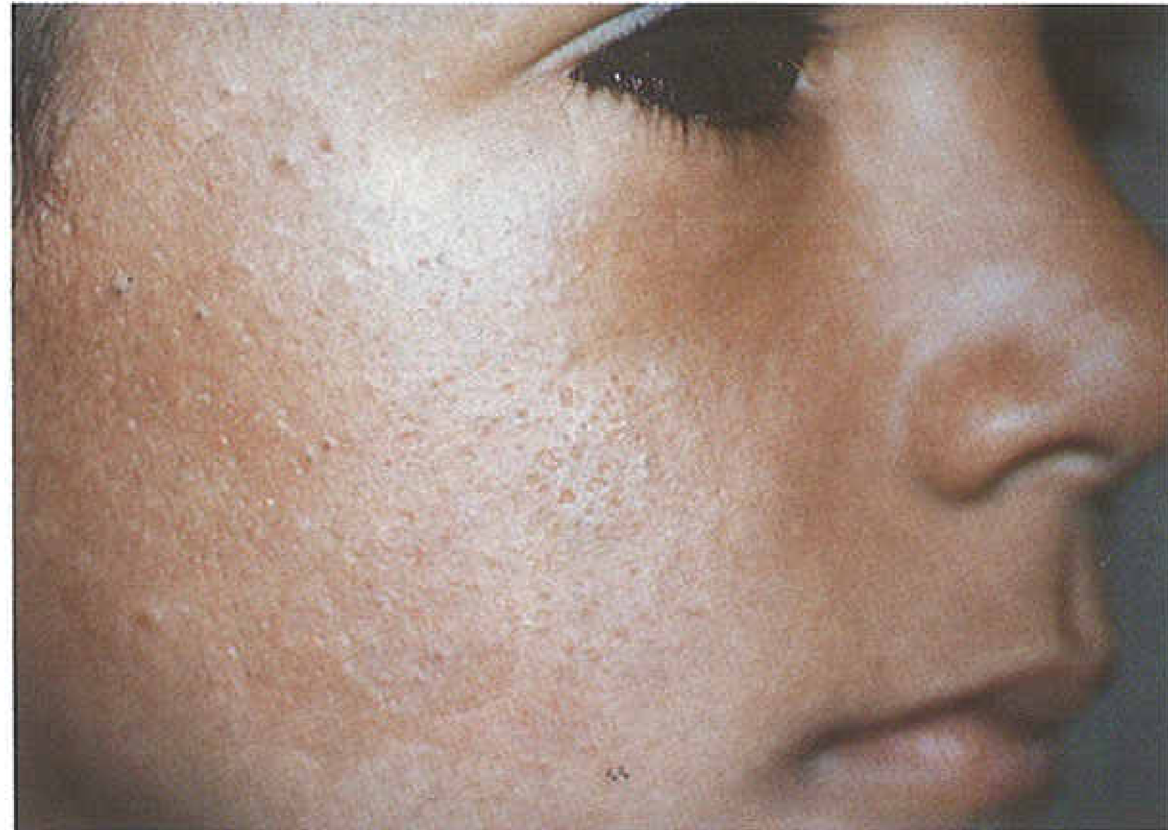
Differential diagnosis included parasitic diseases such as scabies. This was looked for and ruled out, together with other infections caused by viral, atypical mycobacterium, bacterial or fungal infections.

Allergic reactions secondary to environmental exposure such as irritant versus contact dermatitis, phototoxic versus photoirritant dermatitis or airborne reaction, were excluded. The village they live in is non-industrial, non-agricultural and is not known for any chemical hazards. There was no other similar skin conditions in this village.

The clue to diagnosis was only possible when acne developed and we started asking the parents very specific detailed questions, which enabled them to remember swimming in a contaminated sea.

Treatment with Tretinoin cream was





successful and all lesions disappeared (Fig.3,4). Residual pits and wide opening follicles orifices and scars were present. Follow up of patients after 10 months showed no recurrence.

The evolution and description of the skin lesions after exposure is detailed to act as a reference, as this is lacking in the major text books[3].

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