

PREVALENCE OF PITYRIASIS VERSICOLOR IN WAR-WOUNDED AND CHEMICAL (MUSTARD) GAS-WOUNDED PATIENTS IN IRAN-IRAQ WAR

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ABSTRACT

A total of 1118 soldiers who were wounded in war and hospitalized in Tehran, were examined for *P. versicolor*-a superficial mycotic infection.

Of these, 213 were war-wounded, 54 chemical (mustard) gas-wounded, 42 both war and chemical gas-wounded, 105 had infectious and non-infectious diseases, and 704 were apparently healthy soldiers serving in war fronts who were examined for *P. versicolor* and its relation with a history of contact with mustard gas.

In this study the prevalence of *P. versicolor* among the above groups was: 7.40%, 1.85%, 9.52%, 11.42% and 6.11% respectively.

Upon microscopic examination (Scotch tape method) from hyperpigmented parts of the skin resulting from mustard gas, *P. orbiculare* (the etiologic agent of *P. versicolor*) was seen abundantly. This observation leads us to hypothesize that there may be a relation between *P. versicolor* and previous contact with mustard gas.

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INTRODUCTION

Some investigators such as David Taplin, et al¹ conducted research on the prevalence and problems of mycotic infections in U.S. Armed Forces in Vietnam and Thailand.

In their study, dermatological infections were among the important and serious diseases that caused hospitalization of soldiers serving in war fronts: "The overall military statistics indicate that in Vietnam dermatological problems are the most common cause for out-patient visits, often exceeding the combined totals of the two next highest causes: diarrheal and respiratory diseases." Skin problems are reported as the "fourth most common cause of hospitalization in the Army".¹

Table I indicates approximate orders of incidence of skin diseases in three important wars.

P. versicolor is a superficial chronic fungal disease, characterized by lesions varying in color from hypopigmentation to red hyperpigmentation. The areas which

are usually involved are the upper trunk, neck, and upper arms, although lesions may be found elsewhere on the skin with the exception of the soles and palms. The lesions may be papular, numular or confluent. Besides the main complaint of cosmetic disfigurement, some patients also note slight to moderate to severe itching.

In this study we observed some patients who had *P. versicolor* and also had expanded lesions after contact with mustard chemical agent.

MATERIAL AND METHODS

All the war-wounded and chemical gas wounded and soldiers with different diseases, who were hospitalized in Tehran hospitals, were examined for *P. versicolor*.

All healthy soldiers who had lesions suspected to be *P. versicolor* were examined in Khuzestan (the southern province of Iran). The upper trunk, neck and upper

Pityriasis In Gas Wounded Patients

Table I. Approximate order of incidence of skin diseases in three important wars.

| U.S Armed Forces | | Iranian Soldiers (Southern Iran) | |
|--------------------------------------|-------------------------------|--------------------------------------|--|
| World War II | Vietnam | Iran-Iraq war | |
| Overtreatment of other skin diseases | Cutaneous fungal infections | Scabies, cutaneous fungal infections | |
| Cutaneous pyogenic infections | Cutaneous pyogenic infections | Chronic eczematous eruptions | |
| Chronic eczematous eruptions | candidiasis: skin & mucosal | Acne, cutaneous leishmaniasis | |
| Cutaneous fungal infections | Virus diseases of skin | Alopecia, Malaria | |
| Contact dermatitis | Extensive acne | Insect bites, impetigo, dermatitis | |
| Scabies | Insect bites & blisters | Cutaneous pyogenic infections | |
| Insect bites | Malaria | Folliculitis, psoriasis | |
| Seborrheic dermatitis | Contact dermatitis | Seborrheic dermatitis | |
| Urticaria | Eczematous eruptions | Vitiligo, urticaria | |
| Psoriasis | | | |

arms were searched and all lesions suspected to be *P. versicolor* were examined. The Scotch tape method was employed.

All the samples collected were observed microscopically.

RESULTS

The prevalence of *P.versicolor* was found to be 7.04% in war-wounded, 1.85% in chemical (mustard) gas-wounded, 9.52% in war and chemical wounded, 11.42% in soldiers with various diseases and 6.11% in healthy soldiers.

Healthy soldiers with a history of contact with chemical gas weapons were also examined. Some individuals who had hyperpigmented parts of the skin as a result of mustard gas and had no history of a disease, were positive for *P.versicolor* microscopically. This was similar to the microscopic appearance of *M.furfur*-positive samples from individuals who were ill.

DISCUSSION

In adults, *P. orbiculare* can be cultured not only from patients with *P.versicolor* but also from healthy individuals 90-100% of the time, so the mere presence of *P. orbiculare* on the skin is not correlated with

P.versicolor.⁴ The predisposing factors responsible for the production of filaments in *P. orbiculare* are both exogenic and endogenic. *P.versicolor* is more common in tropical areas with high temperature and high relative humidity such as Samoa and Liberia where almost half of the adult population may be affected. In Italy, Caprilli, et al. (1971) found the incidence of *P.versicolor* to be 3.7%.³

P. versicolor is common in southern, northern and central Iran. In an epidemiological survey we found *P.versicolor* in the war-wounded and soldiers in southern Iran. In this study 1118 war-wounded, chemical (mustard) gas-wounded and soldiers with various diseases who had been hospitalized in Tehran, as well as healthy soldiers, who had served in the war fronts, underwent clinical and paraclinical examination for *P.versicolor*.

In this study it was suggested that contact with mustard gas will reactivate and probably increase the virulence of *Pityrosporum orbiculare* in patients who had pityriasis versicolor before contact. On the basis of contact with mustard gas the patients were divided into two groups. Both groups were examined for the presence of Pityriasis versicolor. At the end a statistical "Z" test was performed comparing the results but no significant difference was found between them.

On the other hand, in 34 proven cases of *P.versicolor*, which the patients had a history of contact with mustard gas, 31 (91.17%) patients complained that their symptoms had been aggravated since their con-

Table II. Different groups examined for prevalence of *P.versicolor*.

| group examined | Frequency | Percentage | Positive number | Percentage |
|------------------------|-------------|---------------|-----------------|-------------|
| Chemical gas-wounded | 54 | 4.84 | 1 | 1.85 |
| War-wounded | 213 | 19.05 | 15 | 7.04 |
| War & chemical-wounded | 42 | 3.75 | 4 | 9.52 |
| Un-healthy soldiers | 105 | 9.39 | 12 | 11.42 |
| Healthy soldiers | 704 | 62.97 | 43 | 6.11 |
| Total | 1118 | 100.00 | 75 | 6.71 |

Table III. Frequency of different colors of *P.versicolor* lesions.

| Color of lesions | Frequency (clinical) | Percentage | Microscopically positive |
|------------------|----------------------|---------------|--------------------------|
| Black Brown | 4 | 3.1 | 4 |
| Brown | 68 | 52.3 | 34 |
| Brown and white | 3 | 2.3 | 1 |
| White | 44 | 33.9 | 21 |
| Red | 11 | 8.46 | 7 |
| Total | 130 | 100.00 | 67 |

Table IV. Frequency of anatomical areas involved (*P.versicolor*).

| Anatomical areas involved | Frequency | Percentage | Microscopically positive numbers |
|---------------------------|-----------|------------|----------------------------------|
| Upper arms | 49 | 23.4 | 34 |
| Upper trunk | 91 | 43.4 | 50 |
| Lower trunk | 40 | 19.07 | 22 |
| Neck | 25 | 11.9 | 16 |
| Face | 3 | 1.45 | 0 |
| Groin | 2 | 0.95 | 2 |
| Total | 210 | 100.00 | 124 |

tact with mustard gas.

In another series of examinations we took samples from the hyperpigmented parts of the skin of patients damaged by chemical gas. We saw that although hyperpigmentation was caused by mustard gas in microscopic examination there was colonization and overgrowth of *Pityrosporum orbiculare* (without any clinical manifestation).

Although the continued research is under way, at present, we can conclude that in some way there is a close relationship between contact with mustard gas and *P. versicolor* infection.

The frequency of *P.versicolor* in chemical gas-wounded patients was 1.85% (Table II); they were

severely damaged with expanded erosions and necrosis on the skin. Therefore the prevalence of disease was low.

The statistical "Z" test-among different groups was performed and no significant difference was noted except among un-healthy soldiers (11.42% of *P.versicolor*-Table II) and this was attributed to the admission, prolonged period of hospitalization, antibiotic therapy, corticosteroid therapy, chronic and primary infections, surgical operations and so on.

Healthy soldiers with a 6.11% incidence of *P.versicolor* showed a high frequency of the disease. They had served for long periods of time in the Khuzestan province where the prevalence of *P.versicolor* is high.

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