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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 al[1] 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

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
Psoriais		

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, corticosteriod 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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