FIELD MEDICINE

CHILBLAINS AMONG SOLDIERS – A NEGATIVE IMPACT OF THIS PREVENTABLE DISEASE ON MILITARY PREPAREDNESS IN PEACE

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ABSTRACT

Objective: The objective of this study was to determine the frequency of chilblains among soldiers in general and recruits and cadets in particular during peace time at a climatically cold weather station.

Design: A descriptive study.

Place and Duration of Study: The study was carried out in dermatology department of Combined Military Hospital, Abbottabad during the winter months of Dec 2004 to Mar 2005.

Patients and Methods: Serving soldiers of all ranks who were clinically diagnosed to be suffering from chilblains were included in the study. They were interviewed in detail and examined thoroughly. All the findings were recorded in a pre designed proforma. A separate proforma was filled for each patient.

Results: During the period mentioned above, 493 soldiers were registered in dermatology outpatient department of Combined Military Hospital, Abbottabad for various skin diseases. A total of 41 (8.3%) soldiers were diagnosed and treated as chilblains cases. Out of 364 regular soldiers (Officers, Junior Commissioned Officers and Other Ranks) 10 (2.7%) were having chilblains. On the other hand, out of 129 newly inducted soldiers (Recruits and cadets) 31 (24.0%) were diagnosed as having chilblains. Twenty eight (90.3%) of these newly recruited soldiers belonged to climatically warmer areas and this was their first winter at this cold weather station. Twenty nine (70.7%) of the 41 soldiers were treated in outdoor, whereas 12 (29.3%) were hospitalized. The number of wasted days ranged from 20 to 106 with a mean of 34.66 days.

Conclusion: Chilblains are more frequent among newly recruited soldiers, who are not acclimatized properly and are more exposed to cold because of their training activities.

Keywords: Chilblains, perniosis, cold weather injuries, soldiers.

INTRODUCTION

Exposure to cold can produce a variety of local and systemic injuries that occur as a result of inability of the human to adapt to cold [1]. Chilblains or perniosis is a localized disease of abnormal sensitivity to cold, which develops in certain individuals after prolonged exposure to cold above freezing point. In normal individuals, moderate cold exposure induces cutaneous vasoconstriction succeeded by vasodilatation in an attempt to maintain reperfusion. However, in individuals afflicted by chilblains a persistent cold induced constriction of the large cutaneous arterioles and persistent dilatation of the smaller, more superficial vessels occurs

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[2]. In fact, epidemiology and basic mechanism remain hypothetic [3]; however, chilblains are highly prevalent in France and 2-6% people suffer from chilblains [4]. The lesions present as inflammed erythrocyanotic, painful or pruritic papules or nodules, predominantly over acral parts of the body. The lesions of chilblains are self limiting and resolve within a few weeks. In severe cases, the lesions may take longer to resolve and may persist throughout winters and even during summer months also. Chilblains are preventable and prophylaxis includes avoidance of cold exposure by wearing warm clothing and living in warm housing conditions. Once the lesions have appeared, different therapeutic options include rewarming of the affected parts of the body, vasodilator calcium channel blockers like nifidipine [5], topical minoxidil [2], topical antipruritics and iontophoresis [6] etc.

Chilblains and other cold weather injuries are of great military concern due to their wide ranging impact on military preparedness. In Armed Forces, soldiers of all ranks are rotated regularly to different areas of the country including mountains, plains and deserts etc. At times, they are suddenly exposed to certain climatic conditions for which they are not acclimatized previously. Recruits and cadets are inducted in Armed Forces from all over the country on regular basis. The individuals belong to different areas with different weather conditions and are trained in different military training centers. Some of these military training centers are located at cold areas and others at warm places. As the newly inducted soldiers, during their training period are sometimes exposed to extremes of weather without adequate acclimatization, depending on the location of their training centers and the period at which they are undergoing military training, some of them are at risk of developing adverse effects of the weather changes.

Abbottabad (Kakul) is a cooler station and the average minimum temperature during cooler months of the years remains between 2.5 to 8.0 degrees centigrade.

The purpose of this study was to determine the frequency of chilblains in soldiers in general and recruits and cadets in particular at Abbottabad, a moderately cold weather station, during the period from 1st Dec 2004 to 31st Mar 2005.

PATIENTS AND METHODS

A descriptive study was conducted at Combined Military Hospital, Abbottabad from 1st Dec 2004 to 31st Mar 2005. Serving soldiers of all ranks posted at Abbottabad and surrounding areas, who reported sick at Dermatology Out Patient Department of the Hospital, during the period mentioned above, with erythematous and/or dusky red painful or pruritic nodular lesions of less than 3 weeks duration over digits and/or other peripheral parts of the body were included in the study. After detailed history each patient was examined thoroughly. A proforma was designed which included age and rank of the soldier, permanent address, time at Abbottabad, approximate date of onset of the present episode of chilblains, history of previous episodes of chilblains, involved body areas and approximate time (in days) of either absence from duty or inability to perform his duties fully and actively. A separate proforma was filled for each patient.

Data was analyzed using SPSS ver 10.0. Percentages were used to describe the data. Chi-square test was applied for categorical variables where required to check the significant. $P<0.05$ was considered as significant.

RESULTS

During the study period 493 soldiers were registered in dermatology outpatient department of Combined Military Hospital, Abbottabad for various skin diseases. A total of 41 soldiers of all ranks (table-1) suffering from chilblains reported to Dermatology Out Patient Department of the Hospital during this period. Out of these 41 soldiers, 31 (75.6%) were newly inducted soldiers, i.e. 26 (63.4%) recruits and 5 (12.2%) cadets.

Out of 364 regular soldiers (Officers, Junior Commissioned Officers and Other Ranks) 10 (2.7%) were having chilblains. On the other hand, out of 129 newly inducted soldiers (Recruits and cadets) 31 (24.0%) were diagnosed to be suffering from chilblains. (P <0.05) 35 (85.4%) soldier belonged to warmer areas of the country. Only 6 (14.6%) soldiers belonged to climatically cold weather areas including Abbottabad and its surroundings (table-2). Thirty two (78.0%) including 28 newly inducted soldiers developed chilblains for the first time (table-3).

Twenty nine (70.7%) soldiers were treated as outpatients and 12 (29.3%) were hospitalized. The number of wasted days in terms of either absence from duty or inability to perform duty or undergo training fully and actively ranged from 20 to 106 days with a mean of 34.66 days.

Fingers were involved in 30 (73.2%) soldiers, toes in 23 (56.1%), both fingers and toes in 15 (36.6%) and fingers, toes and other sites like ears, nose, heels and hands all together in 7 (17.1%) soldiers (table-4).

Table-1: Rank wise distribution of chilblains among soldiers (n=41).

Rank	No. of Soldiers	Percentage	Cumulative %age
Recruits	26	63.4	63.4
Cadets	05	12.2	75.6
Regular soldiers	10	24.4	100.00

Table-2: Weather of permanent residence of the soldiers (n=41).

Residence	Frequency	Percentage
Warm areas	35	85.4
Cold areas	06	14.6

Table-3: Duration of chilblains among soldiers (n=41).

Duration (in year)	Frequency	Percentage
1st episode	32	78.0
2 years	04	09.8
3 years	02	04.9
>3 years	03	07.3

Table-4: Frequency of body sites involvement (n=41).

Site	Frequency	Percentage
Fingers	30	73.2
Toes	23	56.1
Ears	07	17.1
Heels	05	12.2
Nose	02	04.9
Hands	02	04.9

DISCUSSION

Chilblains are a term applied to cold induced painful or pruritic erythematous or violaceous acral papular or nodular lesions. The lesions of chilblains develop acutely and present as localized, single or multiple, inflammatory, erythematous or purplish swellings usually involving toes and/or fingers. Lesions may be itchy, painful or have burning sensations. Blistering, ulceration or necrosis may occur in severe cases. In this study, 41 soldiers reported for chilblains and majority of them were newly recruited soldiers, undergoing military training. These soldiers are supposed to be more exposed to extreme of weather as compared to their senior colleagues because of their training activities. Moreover, most of the newly recruited soldiers in our study belonged to climatically warmer areas and were not exposed to such cold weather previously. Many of these were inducted during the months of Oct to Dec and therefore not fully acclimatized to face cold weather. In a study carried out by DeGroot et al, it has been shown that 80% of all cold weather injuries among U.S. soldiers resulted during organized training [7]. Another study carried out among U.S. soldiers at Alaska revealed that 51% of cold weather injuries occurred during field training and 36% occurred while engaging in garrison activities [8]. In our study 75.6% were the soldiers undergoing military training at different training centers of the garrison and 24.4% soldiers developed chilblains during routine garrison activities.

An interesting finding noted in our study was that more soldiers had involvement of fingers than toes and the reason probably was that soldiers put on long shoes for prolong periods and their toes remain protected from cold for most of the time. Development of chilblains not only incapacitates the soldiers physically, although transiently, there is a substantial negative impact on performance of routine duties in the field as well. This results in wastage of a lot of time in terms of either absence from duty or inability to

perform duty or undergo training. In addition to wastage of time, a significant proportion of resources are diverted to treat the patients of this preventable disease, who are hospitalized or even treated in outdoor. In this study, more than one fourth of the patients were hospitalized and a mean of wasted days in respect of the affected soldiers was over a month. Wastage of almost one full month from a limited training period is an adverse effect and carries long term repercussions.

Chilblains and other cold weather injuries are preventable in most instances [9]. Risk factors include inadequate clothing, improperly warm living conditions, dehydration, fatigue and previous cold weather injuries [8]. These can usually be prevented by knowledge, education, and implementation of instructions to avoid cold and humidity.

It is recommended that military training after recruitment of soldiers should start during the period well before commencement of winters at cold weather stations, so that newly inducted soldiers are properly acclimatized and fully equipped to face the extreme weather conditions. Moreover the trainers as well as the commanders at all levels must take the responsibility to educate the newly inducted soldiers to avoid undue exposure to cold by use of warm clothing and gloves etc., in addition to provision of warm living conditions and to make sure that the soldiers are not subjected to unnecessary fatigue.

CONCLUSION

This study suggests that chilblains are more frequent among newly recruited soldiers, as compared to their senior colleagues, for the reasons that newly inducted soldiers are not acclimatized properly and are more exposed to cold because of their training activities. The study further suggests that development of chilblains among soldiers adversely affects military preparedness in peace in terms of time and resources. Chilblains, like other cold weather injuries are a preventable disease. Soldiers as well as commanders must be thoroughly informed about prophylactic measures. Standing Operating Procedures must be formulated, disseminated and implemented in true spirit so that wastage of time and resources can be avoided. It is also suggested that soldiers in particular, those newly recruited, should be acclimatized and gradually exposed to extremes of climatic conditions to avoid cold injuries..

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