PARATROOP MEDICINE *

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Introduction

If I had to give a short definition of paratroop medicine I would say that paratroop medicine is the science of building a physically fit elite, of maintaining it by preventive measures and full understanding of the conditions which may affect this elite in any environment. For this role the Airborne Medical Officer can be a real asset, since he has the same training as any other soldier prior to joining the Airborne Regiment and since he will be expected to do exactly the same things during his posting within the Airborne Regiment as any other of his serving members.

It will be impossible in the short time allowed to this presentation to examine every aspect of paratroop medicine and I will limit myself to specific problems which make paratroop medicine a challenge for the medical officer.

The building of an elite

The first major problem usually encountered by a Medical Officer on his posting with the Airborne Regiment is the increasing number of individuals who should have never been permitted to pass the jump course and allowed to be posted to the Airborne Regiment.

The ideal solution, of course, would be to have all the candidates for the jump course medically examined by the Airborne Medical Officer. This, however, can hardly be done since there is only one medical officer for the Regiment and it is expected that due to commitments he will be away for about six months every year. The direct consequence of this situation is the considerable number of candidates who eventually are posted with the Regiment and who will have to wait sometimes up to six months to be fully fit. The problem is increased by those who have already suffered from certain ailments which can not but flare up during their serving period with the Regiment.

The following are illustrative of these conditions which cripple the Regiment's effectiveness right from the start if they are not corrected or properly assessed.

Conditions which should be corrected prior to posting

External and internal haemorrhoids. Genital and perianal warts. Severe phimosis. Inguinal hernia. Epigastric hernia. Error of refraction. Dental problems. Pustular type acne. Fungus infection. Marked deviation of nasal septum. Chronic tonsillitis problems. Recurrent dislocation of shoulder. Healing fractures. Plantar warts. Ingrown toenails. Claw-like toes.

Conditions which should be carefully assessed prior to posting

This includes the patient with past history of:

Anxiety. Personality disorder. Personal and familial problems. Drug intake. Duodenal ulcer. Low back pain. Hearing loss more H4 than H3. Obesity.

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This list is by no means complete but it gives a pretty good idea of certain candidates we had to deal with in the last two years. I don't believe in a liberal acceptance of candidates for an Airborne Regiment. Due to the numerous commitments an unfit candidate becomes easily a burden medically and also administratively since the remaining members of his section will have to do the work he can not perform himself.

Medical Problems of extreme cold exercises

If we consider the last winter exercises involving the Canadian Airborne Regiment there is no doubt that the frostbite and the tent eye are the greatest cripplers. I will discuss these two problems first and will deal briefly with the so called "Arctic Arthritis" medical condition.

Frostbite

The Airborne Regiment in 1970, during an exercise in Alaska, was severely crippled by frostbite (nearly 10 per cent). After study of the winter equipment used during that exercise which was more than adequate except for minor problems I came to the conclusion that the only way to erase the frostbite problem was by better prevention through introducing a better knowledge of this condition. To this effect prior to the winter exercise in Resolute Bay in November to December 1971 I prepared a paper on frostbite which was widely circulated and discussed at every level within the Regiment (this paper can be found as an Annex to this presentation). Since then the paper is still used and I think the statistics speak for themselves (Table I).

Table I
Comparison of incidence of frostbite during exercises
from 1970 to 1972

Exercise	Grade of frostbite				Total
	1	2	3	4	
1970: Acid Test III. Alaska	49	16	1	0	66
1971: Northern Lancer II. Resolute Bay	8	6	0	0	14
1972: Nomadic Hunter. Alaska	1	8	0	0	9

We hope eventually to arrive to a "no casualty" due to frostbite since each casualty sustained may be crippled easily up to one and a-half years. Prior to each winter exercise the casualties of the previous year are assessed and it is expected that about 50 per cent are still unfit to proceed in an extreme cold environment. If they do go they become prime candidates for the next year's frostbite statistics.

Since you will find in the Annex paper some advice for protection against frostbite, I will just mention here a few of the common causes.

Ill-fitted (not ill-fitting) equipment. Growing of beards. Failure to eat properly and at regular hours. Insufficient drying of equipment. Accumulated fatigue producing decrease of alertness. Lack of protection due to unsatisfactory use of equipment. Failure to react to first degree frostbite. Wearing excessive clothing aboard the aircraft prior to jumping. Overheating.

Tent eye

This entity results from exposure to an atmosphere saturated with fumes produced by gasoline stoves and lamps especially if the combustion isn't complete. It is unusual to see cases of tent eye during the first few days of an exercise unless there is a malfunction of the equipment due to damage on landing, poor care and maintenance, or a faulty undetected part of the stove or lamp. However, concurrently to the progression of the exercise, the number of tent eye tends to grow larger and can affect to a certain degree about 60 per cent of the troops. In 1971 36 cases and in 1972 10 cases (Grades 2, 3, and 4) needed extensive treatment at the Regimental Unit Aid Station (U.A.S.)

For the purpose of future exercises, I now grade tent eye casualties in four grades. Unfortunately in 1971 and in 1972 the tent eye casualties were not recorded by grade and I cannot offer you at this time a more precise statistic.

Fig. 1. Grades of tent eye.

Most common causes of tent eye

Stoves filled in the tent with spilling of the fuel. Use of material broken on landing. (for example, Coleman lamp used without globe). Camouflage of the tent blocking the ventilation opening. Long period of sitting or standing around the stoves. Stoves left to burn without supervision. Stoves placed far away from ventilation system. Failure of the equipment due to damage on landing or due to poor care.

I think it could be beneficial to have a closer look at this entity which I divide for exercise purposes and treatment in four grades (Fig. 1).

Tent eye Grade I

Usually starts by an inflamed appearance of the ocular part of the conjunctiva noticeable mostly by the inflammatory response of the blood vessels. At this stage fresh air is still the best treatment.

If nothing is done to relieve this condition the inflammatory response progresses with a slight itching, burning sensation, and increased production of the lacrimal gland. The tears have a rainbow coloured appearance which will disappear if treated. At this stage we like to use Visine drops (Tetrahydrozoline HCl) one to two drops every 4 to 6 hours.

Tent eye Grade 2

If no treatment is received up to that point the rainbow discolouration due to the fumes starts to stain the conjunctiva itself. The patient then complains of blurring of vision, photophobia, distortion of colour, burning sensation. At this point we have a casualty on our hands. As a treatment we like to use Neo-Cortef Ophthalmic Drops (Neomycin-hydrocortisone) one or two drops every 4 to 6 hours. With sunglasses and removal from the tent environment the patient can be returned to his unit after 24 to 36 hours.

Tent eye Grade 3

The inflammation progresses from the ocular part of the conjunctiva to the palpebral part. The main features added at this point is the pain and the alternation of excessive lacrimation and dryness. For treatment we use Pontocaine Ophthalmic Drops (Tetracaine HCl) followed by Neo-Cortef ointment. The patient at this stage will rarely tolerate an occlusive bandage and we found it useful to put him in a dark room with regular follow-up. He usually remains a casualty for 36 to 72 hours.

Tent eye Grade 4

This happens when a patient already grade three continues to function in the field. Due to the increase lacrimation he will find himself with frozen eyelids. Sedation in this case is often necessary. Since this condition will take 6 to 7 days to disappear we prefer to evacuate the patient suffering from this affliction.

It was thought at first that the tent eye left no sequelae. However, it was noted that a certain percentage of patients who suffered from it during the Resolute Bay exercise in November to December 1971 had to change their prescription lenses in the following months. Due to my posting from the Regiment and the postings of many paratroopers, I was unable unfortunately to establish a proper statistic. This fact is mentioned for further studies.

Arctic arthritis

This condition was first noted in 1970 during the Acid Test III exercise in Alaska. It was believed at the time that this condition was the burden of the older members of the Regiment. This fact was not confirmed in 1971 since two out of five cases seen in Resolute Bay were between 25 and 30 years old. Since then we had some cases in Edmonton and the term "Arctic" becomes incorrect.

The patient presents himself with a swelling of the dorsum of the hand with slight redness. The extension movements are not limited *per se* even if sometimes the swelling makes the movements more difficult. No pain is noted by the patient. A gentle pressure over the tendon produces a crackling sensation which is felt and can even be heard as if at that point there was a lack of lubrication. It appears that direct trauma has no effect in the appearance of this condition. Butazolidine (Phenylbutazone) was tried in these cases with some success. In conclusion I think the term of "Arctic Arthritis" is incorrect

and should be replaced by "Cold Induced Aponeurosis Inflammation". I hope further studies will give us a satisfactory answer to this problem.

Medical problems of typical exercises

In 1970, during the exercise Nimrod Caper II in Jamaica, a number of 250 patient visits (including rechecks) was recorded for a period of four weeks. In 1972, during the exercise Nimrod Caper IV, a number of 1,260 patient visits (including rechecks) was recorded for a period of six weeks. In 1972 104 patients needed hospitalization in U.A.S. holding facilities for a period varying between two and five days. Some consideration over this discrepancy in figures could be of great value for future exercises.

Heat exhaustion—gastro enteritis

The Airborne Regiment had the great pleasure in 1972 to arrive in the middle of an epidemic of gastro-enteritis. This situation coupled with heat exhaustion problems explains the severe number of casualties. About 85 of the 104 individuals held in the U.A.S. facility were suffering from both and a clear demarcation was found to be somewhat difficult to establish. The main causes found were the following:

Too short a period of acclimatization. Very strenuous progressive field exercises. Insufficient water supply (initially two canteens for a four-day period). Limited salt intake (initially one tablet in each canteen). Ingestion of unripe fruits. Inadequate protection against sun (use of the miraculous coconut oil). Poor physical conditioning (militia after two days 70 per cent casualties. After four days 100 per cent casualties). Increased intake of alcoholic beverages. Lack of proper nutrition.

It became evident that the directives expressed by the paper "The Prevention of Heat Casualties" were not followed even if the paper was widely circulated.

The other conclusion we may bring forward is the impossibility of Militia elements to cope with individuals which are physically trained daily all year round. The situation became so hopeless for them that after another try in the field they were removed finally from it.

Cow-itch and fireweed

There were about 20 cases of poison-ivy-like reactions due to contact with fireweed and cow-itch plants. After a few days we instituted the following measures for treatment. To relieve severe itching we found that the best treatment was bathing in bland lotion and a field bath was built. The use of starch was found to be as effective as Aveeno and sophisticated lotion. To control the local and systemic reaction we used, in order of progression, the following treatment:

Calamine lotion. Caladryl lotion (Calamine-Diphenhydramine). Synalar cream 0.025 per cent and 0.01 per cent (Fluocinolone Acetonide). Vioform-Hydrocortisone cream (Iodochlorhydroxyquin-Hydrocortisone). Prednisone p.o. (treatment of 4 days starting at 20 mg and decreasing to 5 mg daily). Corticosteroid I.M. or in I.V. drip followed by tapering doses of oral Prednisone.

Venereal diseases and associated conditions

If we compare Nimrod Caper II and Nimrod Caper IV we found six cases in 1970 and 15 cases in 1972. We were quite satisfied with the number sustained in 1972 since the

soldiers were allowed to go in town every night if they were not on duty. Preventive lectures were given prior to the exercise and during the exercise itself close supervision was maintained by regular visits to the nearest "pleasure houses".

There was some syphilis in the town of Port Antonio at our time of arrival but none was contacted by the troops. We had mostly cases of gonorrhoea and non-specific urethritis. However, upon questioning the "business women", we found that some were infected with *trichomonas*, *Pediculus capitis*, *Pediculus corporis* and pubis. Many of them were infected with *Sarcoptes scabiei* and in the months following the exercise many soldiers were treated for these conditions. As a matter of fact I discovered two cases of scabies nine months after the exercise which shows that sometimes an exercise takes a long time to come to an end.

Some aspects of para-aeromedical medicine

At this point I would like to mention some items of interest and problem areas which have been corrected or remain to be corrected.

Hearing conservation

I would like to mention first the day-to-day fight for hearing conservation. Since the main source of effective of an Airborne Regiment is taken from other regiments it is likely that we will find already many soldiers with sensory neural hearing loss. Because of their previous training they are accustomed to loud noise and have a tendency to overlook the basic safety aspects of flying within noisy aircraft. Because of this paratroopers regularly have to be removed from jumping to prevent further deterioration of their hearing even if the hearing protection is more than well advertised in the Armed Forces.

Beware of carbon monoxide intoxication

A few months ago in the Canadian Forces Base, Edmonton we had aircrew personnel reporting to the Base Hospital with symptoms of headache, nausea, feeling of weakness, decrease work tolerance and slight dyspnea and sweating. Upon questioning, these individuals were loadmasters helping load paratroops in the aircraft and preparing the aircraft for the next drop. It was found that some personnel were doing up to five ten-minute periods of loading in the same morning. Each period recurring every 45 minutes. To prevent further problems we now limit the number of consecutive drops to three and if more are needed the loading crew have to be changed. Since it was stopped in time we couldn't take blood samples after five drops, but we did after three and all tests were found to be below a ratio less than 20 per cent carboxyhaemoglobin.

The helicopter treatment

During the exercise Nimrod Caper IV in Jamaica a real difference was noted between the temperature recorded prior to the evacuation of patients and the one recorded upon arrival. Patient, who prior to the flight, had fever ranging from 103° to 104° would be found with a temperature of 100° to 101° after a flight of 20 minutes in the evacuating helicopter. We may say it is a costly, but very effective, method to fight pyrexia.

Winter long-range airlift and paradrop

During the exercise Acid Test III in Alaska in 1970 many frostbite casualties were sustained right at the beginning of the exercise due to over-heating. The paratroopers

were dressed and rigged in a warm aircraft rendering self-ventilation impossible, consequently almost all jumpers landed in temperatures at minus 43°F with clothing and footwear already wet. To counteract this problem a new procedure had to be established. One hour prior to the jump the aircraft, which is at a temperature of 70°F is gradually cooled at the same time that the jumpers are dressing themselves. If they dress slowly to prevent overheating a good equilibrium can be maintained between the decreasing aircraft temperature and the increasing input of clothing and equipment. There is still a danger, however, for the jump masters who help in the rigging and have to make sure that every strap is tight and equipment properly balanced. When the jumpers are fully dressed and ready to jump the navigation becomes very important since the jumpers are carrying at least their weight on themselves, most of the load being in front of them meanwhile they are trying to hold the static line with one hand and stabilise themselves with the other one. Due to the physical effort needed at that point a waiting period of 20 minutes can be disastrous.

Conclusion

I am sure that after this presentation you will be finally convinced that jumping is happiness. To play his role thoroughly a member of an Airborne Regiment needs better comprehension from those who are directly or indirectly associated with him. For an Airborne Medical Officer this association starts by an always renewed interest, a better understanding of the problems followed by a program of intensive preventive medicine adaptable to every situation with the ultimate goal of correcting old problems and erasing those which may arise.

If in paratroop medicine we don't win every war I hope we will do like England who in all her wars wins always one: the last one.

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