

Comments on Treatment: Frostbite and Allied Conditions

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In peacetime only the physician in northern rural climates is apt to see more than an occasional case of frostbite. In wartime with men stationed in cold climates, the subject assumes great importance, and it behooves the physician to become familiar with its prevention and treatment. We can learn much from the experience of the English, and this article is based on a recent paper of Greene which appeared in *Lancet* (December 6, 1941).

There are various types of frostbite. The most familiar is the sudden frostbite of which the "nipped ear" is the most common example. The gradual frostbite in which the painful sensation of extreme cold gives way to a pleasant numbness is more serious since the damage to tissues is much more extensive. On thawing a flush surrounds the frozen area and invades it. Swelling due to transudation follows, and if the damage is severe, blood may escape into the injured tissue causing it to appear dark blue.

"Trench foot" can be considered a form of gradual frostbite, although it is usually produced by a temperature that is above freezing. It is now recognized that dampness, constriction and stagnation of circulation, fatigue, and malnutrition are important contributory factors. Likewise the new entity, "shelter foot," (a swelling of the feet of one who spent the night in a sitting position without compensatory rest in a horizontal position during the day) has as its main causative factor venous stagnation and possibility increased capillary permeability. A third form, namely "immersion-foot" is seen in men who have been forced to spend a long time in waterlogged boats.

Much can be done to prevent frostbites. The need for adequate clothes is obvious, and the importance of dry socks especially must be emphasized. In the last war it was found that rapid marches just

before the men entered the trenches were particularly prone to cause "trench foot." Sleeping in the sitting position and standing motionless for a long time leads to venous stagnation and thus predisposes to frostbite. The need for exercising the muscles of the leg while standing is to be emphasized. Much foot trouble can be avoided by gently massaging the feet with whale or other types of animal oil. The wearing of rubbers or rubber boots when it is necessary to stand or work in cold mud has been found very effective in reducing "trench foot." The nutritional state is also an important factor and an adequate supply of citrus fruit is undoubtedly beneficial since it prevents capillary hyperpermeability.

In the treatment of frostbite two things must be avoided: excessive warmth and undue friction or rubbing. The frostbitten part must be kept cool and gentle warmth be applied very slowly. Rubbing beyond the stage of very mild massage can only cause destructive damage and increase the danger of infection.

The seriousness of frostbite must be constantly kept in mind. If the feet are involved, the patient should be transported by stretcher, and if the hand or arm is frozen, the affected part must be carried in a sling. It is advisable to paint the part with a nonirritating antiseptic solution and to cover it with sterile dressings. Complete rest of the traumatized part is essential. It is advisable to give antitetanic serum. Supportive treatment, hot foods and drinks, and warmth to the unaffected parts of the body are helpful.

Hasty amputations should be avoided except in cases of spreading and uncontrolled sepsis. It is surprising how often a foot or a hand can be saved that appeared discouragingly bad and hopeless.

—A.J. Quick, MD, editor