

THE SKIN AT ALTITUDE

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High altitude medicine is dominated by acute mountain sickness with its potential serious consequences of pulmonary and cerebral oedema. Understandably the skin is therefore often ignored in planning medical equipment for a high altitude expedition.

The skin can be affected in a variety of ways. First of all in travelling to and from the mountain, different environments will have different effects on skin, infections are more likely to be caught in the lower altitudes rather than the more sterile higher altitudes of the mountain. Of course the higher one climbs the more ultraviolet light there is and usually it would be cold and dry at high altitude with lower partial pressure of oxygen. All these different environments will affect the skin.

Infection

Bacterial infections such as impetigo, folliculitis and secondary infection of other conditions will occur because of poor hygiene. Herpes simplex will occur because of partial immunosuppression of ultraviolet light on the skin, especially on the face. Sunblock applied around the lips will help to prevent the occurrence of cold sores.

Infestation

Infestation with scabies and lice are not an uncommon problem, especially on the travel to and from the mountain, especially with the reduced hygiene of many of the members during the expedition.

Ultraviolet Light

Ultraviolet light is divided into UVA, B and C. UVC is shorter wavelength and is much more toxic to humans, fortunately the ozone layer filters this out. UVA and UVB reach the surface with UVA penetrating better than UVB. However the higher one ascends the less UVB is filtered out and with the combined reflective properties of snow dosages of UVA and UVB will be far higher than at sea level. The UV affects on the skin can be divided into acute and chronic. The commonest acute problem is sunburn and snow blindness. Both are easily avoided with liberal use of high factor sunblocks and wearing UV resistant sun goggles. Chronic effects are ageing, wrinkling of the skin, skin cancers and of course the effect on the eye, ie cataracts. Effective protection against ultraviolet light is essential. The best being UV absorbent clothing, including wide brimmed hats, UV resistant sun goggles/sun glasses and high SPF factor sunscreens for exposed areas such as the nose and face and hands. Having a dark skin type does to some extent protect the skin, however, even indigenous populations of many mountain regions still get sunburnt, so they will need some protection as well.

Cold/Low Humidity

The cold ambient temperatures will allow the air to become less humid and this will have an effect on the stratum corneum, leading to dryness and flaking of the skin. This can lead to cracking and fissuring of the fingers, especially for fine movements such as repairing stoves etc on the mountain which can be very painful.

Cyanoacrylate glues are a good tip for mending fissures, it is painless and non-toxic. Moisturisers/emollients can be used to alleviate dryness of the skin but the weight will deter most people from bothering to carry them.

Hypoxia

A reduction in the partial pressure of oxygen is likely to lead to slower nail and hair growth. Antarctic researchers have demonstrated that the cold will lead to slower nail and hair growth² and it is likely that the lower partial pressure of oxygen will also contribute to the slowing down of the metabolism of the skin and hair.

Recommended Dermatological Medical Kit

High sun protection factor sunscreens

Lipsalves with sunscreens

Antiscabetic and lice treatments

Topical antiviral agents

Soap!

Superglue

Topical antibiotics such as Polyfax or Bactroban

Topical steroid for acute sunburn

Emollients for dry skin

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1. Rigel DS et al. Effects of altitude and latitude on ambient UVB radiation. *J Am Acad Dermatol* 1999; 40: 114-116.

2. Donovan KM. Antarctic environment and nail growth. *Brit J Dermatol* 1977; 96: 507-10.