

Project Title: Effect of supersensitivity to noradrenaline on pain, blood flow, sweating and immune function in the skin

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Ethics permit **2008/048**

Background and aims

The aim of this study was to clarify the mechanisms involved in the chronic pain that sometimes develops after injury to nerves. One of the consequences of nerve injury is an increase in sensitivity to noradrenaline, a chemical that affects blood flow, sweating and immune function in the skin.

Methods

Sensitivity to noradrenaline was augmented in small patches of skin on the forearm of 14 healthy volunteers by introducing guanethidine into the skin with a weak electric current. After four treatments, skin biopsies were taken at treated and untreated sites to find out whether the number of alpha-1 adrenergic receptors was increased at the treated sites in the skin. Changes in sensitivity to heat were also investigated at the treated sites, and blisters were induced and blister fluids sampled to determine whether the treatment influenced immuno-inflammatory responses.

Results and Conclusions

Sensitivity to heat increased at the treated sites, consistent with an inflammatory effect on the skin. However, this was not associated with a change in alpha-1 adrenergic receptors or in levels of inflammatory mediators in blister fluids. These findings suggest that a mechanism that did not involve an increase in the number of alpha-1 adrenergic receptors or release of inflammatory mediators increased sensitivity to heat at the treated sites.