

## **Concentration of cortisol in human hair under rest and pain conditions**

*C.F. Sharples, K. Kauter and J. McFarlane, Department of Physiology, School of Science and Technology, University of New England, Armidale, NSW 2351, Australia.*

Four investigations were conducted into the concentration and responsivity of cortisol in adult human hair. Concentration across body sites (n = 10 males) varied significantly, with highest values in the arms, followed by legs, with the scalp being lowest. However, concentrations within-shaft from a single site were significantly correlated in longer female (n = 12) hair. Two studies of concentration changes following 1 min immersion in ice water (0°C to 4°C) were also conducted. The first study (n = 3 males) showed immediate, brief and localized increases in cortisol from hair on the immersed forearm but not from hair on the opposite lower leg. The second study (n = 5 males) showed further localization of hair cortisol changes along the forearm, with independent responses being observed in areas only 250mm apart. These results are considered within a model of localized anti-inflammatory hair cortisol responses to trauma and add to our knowledge of the peripheral cortisol synthesis system in human hair.