Tactile sensitivity of glabrous and hairy skin over the life span

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Abstract

Tactile sensitivity is often impaired in older adults, which contributes to the loss of manual dexterity and mobility function. Here we tested a validated method to determine tactile spatial discrimination on the index finger pad and compared these data with a classical test of force detection sensitivity applied at this same glabrous skin site, but also on two hairy skin sites, the forearm and cheek. Spatial discrimination was estimated through the ability of participants to evaluate the distance between bands printed on poly-methyl-methacrylate sheets, as explored using the dominant index finger. Calibrated nylon monofilaments were applied at the dominant index finger, forearm, and cheek of 96 healthy women aged from 20 to 75 years. Tactile spatial discrimination and tactile force detection on the index finger significantly decreased with the age. Tactile force detection on the forearm was significantly correlated with tactile force detection on the index and the cheek, although this sensitivity was well-preserved with age on the cheek and forearm. These data confirm the existence of some sparing of tactile sensitivity in hairy skin, but less so on glabrous skin. This opens discussion about the impact of daily activities upon the mechanisms of tactile transduction at the palmar side of the hand, but also the function of hairs in tactile sensitivity. Finally, we discuss the need of new methods for evaluating tactile sensitivity upon the hairy skin.

Keywords: touch, glabrous skin, hairy skin, aging, discriminative touch

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