
Skin type and nerve effects on cortical tactile processing: a somatosensory evoked potentials study

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Abstract

Objective: Tactile cortical processing is a complex phenomenon and is still not completely understood. Somatosensory evoked potentials (SEP) can be used to characterize its time-course and processing steps, but existing studies rarely considered 1) skin type at the stimulation site, 2) the nerve being stimulated, and 3) middle latency (> 30 ms) components. Our aim was to investigate middle latency SEPs following simple mechanical stimulation of two skin types innervated by two different nerves.

Methods: 18 adults aged 20 to 32 received 400 mechanical stimulations over four territories of the right hand (two nerves: radial/median; two skin types: hairy/ glabrous skin) while their EEG was recorded, in front of a screen projecting a black cross on a gray background.

Results: Four middle latency components were identified for all subjects: P50, N80, N130 and P200. Consistent with previous reports, significantly shorter latencies and larger amplitudes were found over the contralateral hemisphere for all components. A skin type effect was found for the N80: larger amplitude was induced by glabrous skin stimulations than hairy skin stimulations. Regarding nerve effects, median stimulations induced larger P50 and larger amplitudes and longer latencies of the N80 component than radial stimulations. A significant nerve by electrode interaction was found for the P50, emphasizing differences in the topographies for median and radial nerves.

Conclusions: This study showed that skin type and stimulated nerve modulate middle latency SEPs, highlighting the importance of taking them into account.

Keywords: glabrous skin, middle latency SEP, median nerve, radial nerve

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