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Evoked magnetic responses of the human auditory cortex to minor pitch changes – localization of the mismatch field ***ELECTROENCEPHALOGRAPHY AND CLINICAL NEUROPHYSIOLOGY*** **84:** *pp. 538-548.* (1992)

Abstract

The neuromagnetic source localizations of the auditory M100 and the mismatch field (MMF) were studied using a large-array biomagnetometer. Standard tones of 1000 Hz and deviant tones of 1050 Hz were delivered with 90% and 10% probability, respectively. Wave forms of the derived MMF were computed by examining difference wave forms between the responses to the deviants and the responses to the standards preceding (D-P) and following (D-F) the deviants as well as to all remaining standards (D-A). The subset of standards preceding the deviants was used for a more realistic comparison with the set of deviants (having the same number of epochs and a similar signal-to-noise ratio). while the subset of standards following the deviants served to answer the question whether those standards also elicit an MMF. The MMF deflections were compared with each other, with the "native" MMF occurring in response to the deviants, and with wave M100. (The MMF as it appears in the unprocessed response to the deviants was termed "native" for an easy distinction from the "derived" MMF).

Our results demonstrate a distinct MMF deflection, corresponding in latency to the simultaneously recorded fronto-central electrical MMN. Source analysis, using a single moving dipole model, showed the same spatial localization for the native MMF and for the different derived MMFs. The MMF source location turned out to be significantly anterior, medial and inferior relative to the sources of the M100. The present data also demonstrate that a minor frequency deviation may not activate measurably different M100 generators, yet be sufficient to trigger the nearby but spatially distinct mismatch generator.