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RELIABILITY OF P50 GATING IN NORMAL SUBJECTS

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Recent reports by Boutros et al. (1991) and Smith et al. (1994) indicate that P50 responses to S1 and S2 are reliably measured, but not the primary index of gating, the ratio S2/S1. The present study examined these observations further by testing the auditory P50 response for five consecutive days (128 trials/day) in fourteen normal subjects (8 females, 6 males). During each daily testing session, EEG was collected from Fz (mid-frontal) and Cz (vertex) while 128 pairs of click stimuli (S1 and S2) were presented. For each day, split-half and overall measures were made of P50 amplitudes and latencies to the conditioning response (S1) and test response (S2), and the ratios of the S2 response to the S1 response were calculated ($T/C \text{ ratio} = S2/S1 \times 100$).

Within session reliability was determined by a split-half method for each day of testing. P50 indices were more reliable at Fz (mean intraclass correlation coefficients, ICCs: S1 amp = 0.91, S2 amp = 0.71, S2/S1 = 0.31) compared to Cz (S1 amp = 0.78, S2 amp = 0.39, S2/S1 = 0.29).

Between session reliability was computed by two methods. First, cross-correlations between all combinations of days showed that P50 S1 amplitude was significantly correlated ($p < 0.05$) in seven of the ten possible pairs. P50 S2 amplitude was significantly correlated in five of ten pairs. For the gating ratio (S2/S1), only one of ten correlations was significant. The correlations between adjacent days were no more significant than those for non-adjacent days. In a second set of analyses, intraclass correlation coefficients (ICCs) were calculated for successive days to determine reliability across multiple testing sessions. P50 amplitudes (Fz) were reliable with ICCs increasing from 0.81 to 0.93 for S1 and from 0.86 to 0.92 for S2 across successive days. The gating ratio showed very poor reliability and increased to only 0.55 with 5 days of testing.

In conclusion, these data indicate that P50 responses to S1 and S2 were reliably measured within and between testing sessions, but the gating ratio was not reliable. These findings are consistent with previous reports, but further indicate that, even with as many as 640 trials (i.e., 5 days of testing), P50 gating ratios were not reliably measured.