CORRESPONDENCE

COMPUTERS IN ECT AND PAPERLESS EEG MONITORING

Sir,

EEG monitoring during ECT procedure to measure the duration of seizures has been recommended (American Psychiatric Association, 1990; Freeman et al, 1989). We have designed an EEG amplifier of 2 channels with a gain of 2000 and filter settings of 2Hz (high pass), 40Hz (low pass) and 50Hz (notch filter) and recorded from F3 and F4 referenced to ipsilateral mastoids with ground on forehead. EEG was digitized (256Hz) with a 8 bit A-D converter and displayed (8 seconds per screen) simultaneously with a seconds counter using a personal computer on its CGA monitor. Display of both EEG and counter was triggered by the ECT stimulus offset. EEG was also recorded from a commercially available EEG machine on paper (1.5 cm/sec) at comparable settings of gain and filters

Motor seizure duration on the cuffed right forearm was monitored (BNG) blind to the EEG seizure. Viewing the EEG seizure and the timer on the computer monitor, the seizure duration was rated independently (PKM) without knowledge of motor seizures. Coded, paper records of EEG were rated for seizure duration (BNG) without knowledge of the clinical details. A broad clinical definition of seizure termination (unequivocal absence of epileptiform transients for five or more seconds) was adopted for scoring seizure EEG on the computer monitor as well as on paper. (A more refined criterion may be possible with a greater resolution of EEG waveform display than is possible on the CGA monitor).

Consenting patients (n=21, 12 males; mean, SD age 29, 10 years) receiving either bilateral (n=15) or right unilateral ECT (n=6) under anesthesia formed the sample. ECT stimulus was delivered using a constant current, brief pulse, computerized ECT machine developed at NIMHANS. The stimulus dose ranged from 60 to 240 mC.

EEG seizure durations estimated from the paper record (mean= 58.5 secs, SD= 34) and from the computer display, (mean= 58.3 secs, SD= 34) correlated significantly (Intraclass correlation, r= 0.99, p<0.001). EEG seizure duration estimates from computer display also correlated (Intraclass correlation, r= 0.82, p<0.01) with motor seizure duration (mean= 42 secs, SD= 17) and were significantly longer than motor seizure duration (paired 't'= 3.2, p<0.01). This may be regarded as a partial validation of the seizure duration estimates from the computer display. The study suggests that seizure monitoring with computer display is a reliable alternative to paper recording. This overcomes the mechanical problems with paper recording and recurring cost of paper (more so if thermal paper is used) as well as the problem of storing paper records. The use of computer also allows application of other algorithms (Krystal et al, 1993) to the EEG seizure to redefine its adequacy as suggested by Swartz (1993).

B.N. Gangadhar
V.S.Candade
G.Laxmanna
N.Janakiramaiah
P.K. Mahapatra,

Departments of Psychiatry and Biomedical Engineering, National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore 560 029 and National Institution for Quality and Reliability, Bangalore.

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