

## Comparison of cardiovascular responses in bifrontal and bitemporal ECT

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**Introduction:** ECT has re-emerged as an important mode of treatment in severe depression and many other psychiatric conditions. Studies have shown that ECG changes after ECT are the result of increased sympathetic activity following massive release from the hypothalamus. Physiological parameters such as blood pressure (BP) and heart rate (HR) reflect autonomic response after seizure and may correlate with therapeutic efficacy in electroconvulsive therapy (ECT). There is evidence that BFECT is either equally effective or superior to bitemporal ECT (BTECT).

The study was undertaken to evaluate the impact of ECT on cardiac work load using RPP-product of arterial blood pressure and heart rate. We also examined if there is any difference in the hemodynamic response between bitemporal and bifrontal electrode placements.

**Methods:** Of 122 patients who were randomized to receive either BFECT or BTECT, 114 completed the study. Under standard anesthetic modification (Thiopentone 2-4mg/kg & succinylcholine 0.5-1 mg/kg) stimuli were delivered at 1.5 times the threshold level. We recorded pulse and blood pressure of patients including ECG just before induction of anesthesia, after the induction of anesthesia but just before electrical stimulation, during convulsion, 1 minute following cessation of seizure and 2 minute following seizure during 2nd ECT session in 88 patients. At each of these 5 time points, we calculated the rate-pressure product (RPP) by multiplying heart rate and systolic blood pressure. Complete data was available for 51 in BFECT and 37 in BTECT.

**Results:** The RPP was significantly higher during the ictal and post-ictal recordings (repeated measures

ANOVA, time effect:  $F=50.71$ ;  $df=4,332$ ;  $p<0.001$ ). The mean RPP was highest during the seizure ( $p<0.001$ ) and was 85% higher than that of baseline. However, there was no difference in RPP across time points between those receiving BFECT and BTECT (group effect:  $F=0.459$ ;  $df=83$ ;  $p=0.5$ ). There was no difference in maximum heart rate [mean (SD) for BFECT and BTECT = 127.04 (26.3) and 127.89 (22) respectively;  $t=-0.161$ ;  $p=0.87$ ], maximum systolic blood pressure [mean (SD) for BFECT and BTECT = 165.74 (24.5) and 161.29 (26.1);  $t=0.819$ ;  $p=0.415$ ], maximum rate pressure product [mean (SD) for BFECT and BTECT groups = 20768 (6719.7) and 20217 (5991.1);  $t=0.397$ ;  $p=0.693$ ], maximum rise in heart rate [mean (SD) for BFECT and BTECT = 23.96 (26.6) and 23.81 (21.1);  $t=0.028$ ;  $p=0.977$ ] and maximum rise in RPP [mean (SD) for BFECT and BTECT = 6799 (6434.1) and 7223 (5395.8);  $t=-0.326$ ;  $p=0.746$ ].

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