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EFFECTS OF ELECTROCONVULSIVE THERAPY ON HEMOGRAM-DERIVED INFLAMMATORY INDICES IN BIPOLAR MANIA: A CASE–CONTROL STUDY

İrem Demiral, Sinay Önen, Emine Merve Akdağ

University of Health Sciences, Bursa Yuksek İhtisas Training and Research Hospital, Department of Psychiatry, Bursa, Türkiye

BACKGROUND AND AIM: Bipolar mania has been linked to peripheral immune activation and low-grade inflammation, while the mechanisms of ECT remain unclear. Hemogram-derived indices(e.g., NLR,PLR,MLR) and composite measures such as SII,SIRI,PIV are practical, low-cost surrogates of systemic inflammation(1). We compared these indices between manic bipolar patients and healthy controls and assessed pre–post ECT changes.

METHODS: (Ethics Committee Approval must be obtained and the number should be specified). The study included 34 patients with bipolar disorder who received ECT during the manic phase and 42 healthy controls. Pre- and post-ECT blood samples were collected to assess Hemogram-Derived Inflammatory Indices including neutrophil-lymphocyte ratio(NLR), platelet-lymphocyte ratio(PLR), monocyte-lymphocyte ratio(MLR), neutrophil-platelet ratio(NPR), systemic immune-inflammation index(SII), systemic inflammation response index (SIRI) and pan-immune-inflammation value(PIV). Clinical outcomes were measured using the Young Mania Rating Scale(YMRS) and Clinical Global Impression(CGI) scale (Ethics Committee Approval No: 2011-KAEK-25 2019/04-19).

RESULTS: Before ECT, the bipolar mania group differed significantly from healthy controls in terms of NLR(p = 0.015), NPR(p = 0.018), MLR(p=0,001), SII(p=0.024), SIRI (p<0,001), and PIV(p=0,001). Following ECT, no significant changes were detected in NLR (p=0.122), PLR(p=0.149), NPR(p=0.185), MLR(p=0.713), SII(p=0.139), SIRI(p=0.675) or PIV(p=0,884) within the bipolar mania group.

CONCLUSIONS: Despite marked clinical improvement after ECT, hemogram-derived indices showed no significant pre–post change. Consistent with our null pre–post changes in hemogram-derived indices, prior bipolar ECT case–control data likewise found no significant change in NLR or PLR and reported that NLR remained higher than in healthy controls after ECT (1-3). The stronger statistical separation between the mania and healthy control groups observed for monocyte-inclusive indices (MLR, SIRI, and PIV) may indicate a predominantly monocyte-driven inflammatory signal in bipolar mania and suggest that these composite measures are more sensitive to case–control differences than classical ratios such as NLR or PLR. Future studies should standardize timing, use multiple time points, and add CRP- and monocyte- based measures.

Keywords: Bipolar disorder, electroconvulsive therapy, inflammation, inflammatory indices