EFFECT OF ECCT (*Electro-Capacitive Cancer Therapy*) THERAPY ON LEUKOCYTE PROFILE AND $CD4^+/CD8^+$ RATIO FOR HEALTHY VOLUNTEERS

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ABSTRACT

Breast cancer is the most common type of cancer in women which is invasive and often lead to death. Various methods are developed to treat breast cancer. ElectroCapacitive Cancer Therapy (ECCT) is a novel cancer treatment that works based on noncontact static electric fields at medium frequency and low intensity to inhibit tumor cells proliferation. This study was aimed to analyze the safety and effect of low-frequency (100kHz) low-frequency (100 VHz) ECCT static electric field therapy on clinical parameters of leukocyte profiles and immune responses related to $CD4^+/CD8^+$ ratio. This research is one part of phase 1 clinical trials conducted on 40 healthy volunteers. Before and during the Phase 1 clinical trial, healthy volunteers will undergo examination of physical parameters and clinical parameters (hematological profile, $CD4^+$, $CD8^+$, tumor marker, blood chemistry) in the blood, and ultrasound. The duration of treatment for ECCT lasted for 21 days with a difference of 2 treatments, namely ECCT, ON and OFF conditions with an ECCT usage schedule of 10 hours per day and total clinical examination twice, namely pre and post clinical trial therapy. Data were analyzed statistically based on t-Test and ANOVA. The results showed that the mean and SD values of the ECCT OFF group test parameters were leukocytes *pre* and *post* are leukocytes (6,48 ± 1,66 - 6,67 ± 1,60), basophil (0,42 ± 0,31 - 0,42 ± 0,35), eosinophil (2,48 ± 1,42 - 2,74 ± 1,92), neutrophil (61,14 ± 6,29 - 61,60 ± 6,18), limphocyte (27,42 ± 5,41 - 27,24 ± 5,14), monocyte (6,64 ± 1,12 - 6,69 ± 1,43), NLR (2,38 ± 0,77 - 2,40 ± 0,76), $CD4^+/CD8^+$ ratio (1,23 ± 0,34 - 1,20 ± 0,39). For the Group ECCT *ON pre* and *post* are leukocytes (6,80 ± 1,33 - 6,83 ± 1,41), basophil (0,43 ± 0,30 - 0,33 ± 0,18), eosinophil (2,08 ± 1,43 - 3,01 ± 1,96), neutrophil (63,68 ± 5,85 - 61,73 ± 6,22), limphocyte (25,15 ± 4,85 - 26,35 ± 5,59), monocyte (6,44 ± 1,28 - 7,04 ± 1,65), NLR (2,69 ± 0,83 - 2,50 ± 0,79), $CD4^+/CD8^+$ ratio (1,40 ± 0,41 - 1,46 ± 0,35). The results showed that all parameters related to leukocyte profile did not differ significantly ($p > 0.05$) except for eosinophil type leukocytes on the use of the ECCT vest the ON condition experienced a significant increase ($P < 0.05$) in the t-test analysis of the treatment group. However, all parameters are still within the normal value range based on the normal range (reference value) issued by the UGM RSA laboratory. The conclusion obtained from this study is that the exposure to low-frequency (100 kHz) low-intensity static electric field (18 Vpp) from a vest-shaped ECCT device can be declared safe for leukocyte profiles and $CD4^+/CD8^+$ ratios.

Key Words: ECCT, Breast cancer, Electric field, Clinical trials.