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Vegan diet reduces neutrophils, monocytes and platelets related to branched-chain amino acids - A randomized, controlled trial

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Abstract

Background: Vegan diet (VD) has improved inflammatory activity in patients with rheumatoid arthritis (RA) in several small controlled trials. The underlying mechanism remains widely unclear. We investigated the effect of a VD in comparison to a meat-rich diet (MD) on markers of inflammation (which have been shown to be relevant in patients with RA) in healthy volunteers.

Methods: 53 healthy, omnivore subjects were randomized to a controlled VD (n = 26) or MD (n = 27) for 4 weeks following a pre-treatment phase of a one week controlled mixed diet. Primary parameters of interest were sialylation of immunoglobulins, percentage of regulatory T-cells and

level of interleukin 10 (IL10). Usual care immune parameters used in patients with RA and amino acid serum levels as well as granulocytes and monocytes colony stimulating factor (GM-CSF) serum levels were secondary parameters.

Results: In the VD group, total leukocyte, neutrophil, monocyte and platelet counts decreased and after four weeks they were significantly lower compared to the MD group (ANCOVA: leukocytes p = 0.003, neutrophils p = 0.001, monocytes p = 0.032, platelets p = 0.004). Leukocytes, neutrophils, monocytes, and platelets correlated with each other and likewise conform with serum levels of branched-chain amino acids, which were significantly lower in the VD compared to the MD group. The primary parameters did not differ between the groups and BMI remained stable in the two groups.

Conclusion: Four weeks of a controlled VD affected the number of neutrophils, monocytes and platelets but not the number or function of lymphocytes. The relation with branched-chain amino acids and GM-CSF suggests a mode of action via the mTOR signaling pathway. REGISTERED AT: http://www.drks.de (German Clinical Trial register) at DRKS00011963.

Keywords: GM-CSF; Granulocytes; Immunoglobulin glycosylation; Inflammation; Leukocytes; Lymphocytes; Nutrition; Rheumatoid arthritis; mTOR.

Comment in

Comment on "vegan diet reduces neutrophils, monocytes and platelets related to branched-chain amino acids - A randomized, controlled trial".

Kumar R, Borthakur D, Dada R.

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Reply - Letter to the editor: Comment on "Vegan diet reduces neutrophils, monocytes and platelets related to branched-chain amino acids - A randomized, controlled trial".

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