007 Health supplement Spirulina induces inflammatory cytokine production via monocyte derived dendritic cells and classical monocyte activation in Dermatomyositis

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The popular herbal supplement Spirulina has previously been shown to stimulate inflammatory cytokine production in Dermatomyositis (DM) patients in vitro. We sought to evaluate whether Spirulina’s immunostimulatory effects differ in healthy controls (HCs) compared to DM. We performed ELISA on Spirulina stimulated HC and DM PBMC supernatants, demonstrating similar effects in both HCs and DM with Spirulina significantly increasing TNFα and IFNγ levels. Inhibition of TLR4 or TBK1 significantly decreased Spirulina’s immunostimulatory effects on both TNFα (p<0.0001) and IFNγ (p<0.05) at 0.3 mg/ml Spirulina. Using flow cytometry, we investigated Spirulina’s immunostimulatory effects at the cellular level, demonstrating that TNFα and IFNγ secretion, Spirulina has the greatest effect on monocyte-derived dendritic cells (MoDC) and a lower effect on classical monocytes (CM) in an in vitro stimulation at 0.3, 1, and 3 mg/ml Spirulina, the percent of MoDCs secreting IFNγ increased from a mean (SEM) of 0.1% to 96.4% and 96.9% (1.0%) (p<0.0001), respectively and the median fluorescent intensity (MFI) increased similarly, (n=3, p<0.0001). The mean percent of CMs secreting IFNγ also increased (p<0.0001), and pre-treatment with TLR4 inhibitor suppressed CM activation (p<0.05). Moreover, the MFI of CMs secreting IFNγ increased significantly (p<0.005). TLR4 or TBK1 inhibition decreased MFI for both moDC and CMs (p<0.05 and p<0.01, respectively). TNFα+ MoDCs increased from 1.14% of total MoDCs with no stimulation to 49.10% (12.4) at 0.3 mg/ml Spirulina (p<0.0001). TLK4 and TBK1 inhibition suppressed the percentage of Spirulina-induced MoDCs secreting TNFα (p<0.05). TL4 inhibition trended towards significance for both conditions (p=0.033). These data demonstrate that Spirulina induces CM and MoDC activation in DM, likely via TLR4 or TBK1 activation.

008 Multiplexed skin immunophenotyping of new-onset dermatomyositis following first time use of Spirulina

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Dermatomyositis (DM) is a rare inflammatory disease characterized by inflammation of the skin and muscle. It is often associated with other autoimmune diseases such as rheumatoid arthritis and SLE. The diagnosis of DM is typically made based on clinical and laboratory findings, but the underlying pathogenesis is not fully understood. In our study, we utilized a multiplexed immunophenotyping approach to investigate the immune cell populations present in skin biopsies from patients with DM. We observed a significant increase in the number of CD8+ T cells and a decrease in the number of regulatory T cells in DM compared to healthy controls. These findings suggest that DM may be associated with an immunopathological response that targets CD8+ T cells and suppresses the activity of regulatory T cells. This research provides new insights into the immune mechanisms underlying DM and may contribute to the development of novel therapeutic strategies.