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The in vitro Effects of Various Immunomodulatory Nutritional Compounds on Antigen-Stimulated Whole-Blood Culture Cytokine Production

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Abstract : Immunomodulators are substances that alter immune system via dynamic regulation of messenger molecules. It can be divided into immunostimulant and immunosuppressant. It can help to increase immunity of people with a low immune system, and also can help to normalize an overactive immune system. Aim of this study is to investigate the effects of in vitro exposure to low and high doses of several immunomodulators which include caffeine, kaloba and quercetin on antigen-stimulated whole blood culture cytokine production. Whole blood samples were taken from 5 healthy males (age: 32 ± 12 years; weight: 75.7 ± 6.1 kg; BMI: 24.3 ± 1.5 kg/m2) following an overnight fast with no vigorous activity during the preceding 24 h. The whole blood was then stimulated with 50 µl of 100 x diluted Pediacel vaccine and low or high dose of immunomodulators in the culture plate. After 20 h incubation (5% CO2, 37°C), it was analysed using the Evidence Investigator to determine the production of cytokines including IL-2, IL-4, IL-10, IFN-γ, and IL-1α. Caffeine and quercetin showed a tendency towards decrease cytokine production as the doses were increased. On the other hand, an upward trend was evident with kaloba, where a high dose of kaloba seemed to increase the cytokine production. In conclusion, we found that caffeine and quercetin have potential as immunosuppressant and kaloba as immunostimulant.

Keywords : caffeine, cytokine, immunomodulators, kaloba, quercetin
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