

Comparison of Vegetable Oils Rich in Alpha or Gamma-Linolenic Acids Focusing on Serum Cytokine Levels and Histopathological Changes in Autoimmune-Prone Mice

Matsuhisa, T¹, Mei, L², Ohara, A¹

¹ *Meijo University, Nagoya, Japan*

² *Gifu Women's University, Gifu, Japan*

Effect of the administration of C18 unsaturated fatty acids on autoimmune-prone male mice (MRL/lpr strain) was investigated. The vegetable oils containing a high proportion of alpha or gamma linolenic acids (ALA or GLA, 57.4%) were respectively given to the autoimmune-prone male mice (soybean oil as control group). Linseed oil was used as ALA-rich oil (ALA content:57.4%). Borage oil was enzymatically modified to contain 57.4% of GLA and was fed as GLA-rich oil. AIN-96G based diets containing 7%/20% of the oils were fed to the animals. Histopathologic examination of tissue sections of the spleen and kidney was also made by hematoxylin and eosin stain and Masson's trichrome stain. After feeding the diets 10-wk, mice went through 16-hr fasting and were subjected to examination. Cytokines in serum and urine albumin were determined by Enzyme-linked immunosorbent assay. After 10-wk administration of the diets, the level of anti-dsDNA autoantibody in ALA-rich diet group and GLA-rich diet group was significantly suppressed in comparison with control diet group. Spleen swelling was suppressed by the administration of ALA- and GLA-rich oils, compared with control diet group. There was no difference in the body-weight ratio of liver, kidney and thymus among the three groups. The ALA-rich diet group showed a significant lower level in the production of TNF alpha, IL-6, IL-10 and IL-1beta in the serum in comparison with the other oil groups. The concentration of albumin in urine of ALA-rich diet group was significantly lower than that of the other groups. The dermatitis in the ear of the mice of GLA-rich diet group and control diet group were recognized, but not found in ALA-rich diet group. Histopathological results showed the occurrence of lymphoma in the spleen of GLA-rich diet and control diet groups. Control diet group showed the expansion of splenic white pulp with the reduction in red pulp. On the other hand, ALA&GLA-rich diets did not induce it. Lymphocyte infiltration was found in the kidney of control diet group and GLA-rich diet group. Collagen hyperplasia was not found in the experimental animals.