Effects of a Regional Chinese Diet and Its Vitamin Supplementation on Proliferation of Human Esophageal Cancer Cell Lines

YAN JIANG*, †, HUI-ZHANG DU†, WEN-YI ZHU**, HUI-JUAN XIAO#, AND CHENG-YU HUANG*†, 2

*Department of Nutrition and Food Hygiene, West China School of Public Health, Sichuan University, Chengdu 610041, Sichuan, China; †Yanting Cancer Research Institute, Yanting 621600, Sichuan, China; #College of Life Science and Technology, Xinjiang University, Iliurunchi 830046, Xinjiang, China

Objective To study the effects of a local diet popular in Yanting region (YT diet) on the proliferation of two human cell lines (Eca-109 esophageal squamous cell carcinoma line and HL7702 normal liver epithelial cell line) in rats by a sero-physiological approach. Methods Male SD rats were divided into six groups and fed respectively with a conventional diet and the YT diet (one of the five experimental diets) supplemented with two vitamin mixtures (Mix.1: vitamins A, E, and folic acid; Mix.2: mix.1 plus riboflavin and vitamin C) at two different doses. On the 30th day, sera were collected from the rats and added into a medium for cell culture, with 10% FBS used as a serum control. The effects were assessed by MTT assay, DNA synthesis and flow cytometry assays. Results Compared with the control, the sera from rats fed with the YT diet significantly promoted the proliferation of Eca-109 cells, which was, however, reversed by the supplementation with two vitamin mixtures at high doses. Surprisingly, the same treatment produced contrary effects on HL7702 cells as compared with Eca-109 cells. Conclusion The sera from rats fed with the YT diet could promote the proliferation of human esophageal cancer cell line Eca-109, whereas the sera from those fed with the YT diet supplemented with vitamin mixtures might have inhibitory effects on the proliferation of Eca-109 cells.

Keywords: Diet; Esophageal cancer; Vitamin supplementation; Sero-physiology; Cell proliferation; Rats

REFERENCES


* This work was supported by grants from the National Natural Science Foundation of China (30571559).
† Correspondence should be addressed to Cheng-Yu HUANG, Department of Nutrition and Food Hygiene, West China School of Public Health, Sichuan University, Chengdu 610041, Sichuan, China; Tel: 86-028-85501170. Fax: 86-028-85501170. E-mail: hcynuph@163.com
‡ Biographical note of the first author: Yan JIANG, female, born in 1977, Ph. D, research direction: nutrition and disease.