

Caloric restriction and cancer: from the viewpoint of anti-aging medicine.

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In this seminar, anti-aging medicine is outlined, and the relationship between obesity, caloric restriction and cancer is examined. Anti-aging medicine is a field of preventive medicine focusing on health promotion and the achievement of long and healthy life. The main objectives of anti-aging medical treatments are to prevent aging and promote rejuvenation in terms of functional age.

Deterioration in the metabolic function often becomes a problem in male and females of middle age. Obesity is a manifestation of metabolic disorder, which promotes vascular aging, *i. e.* atherosclerosis, eventually causing cardiovascular events. Thus, obesity should be treated by exercise, adequate diet therapy, and medical therapy if necessary. We must be careful when using the word or therapy “caloric restriction”, because sometimes extreme diet decreases basal metabolic rate, immune function, or causes mental stress, leading to weakness of muscle and bone, and ultimately resulting in the deterioration of quality of life. Another problem is that the word “caloric restriction” often attracts persons who do not need to become thinner. What we need is an adequate caloric control on each individual patient.

In terms of cancer, obesity increases the risk of cancer in mammary and prostate glands. Sex hormones such as estrogen and testosterone, , tend to accumulate in the fat tissue due to their lipid solubility, thus generating excess amount of carcinogenic metabolites including 16α -hydroxy-estrone and dihydro-testosterone. On the other hand, emaciation, the loss of fat, increases the risk of various kinds of cancer. Fat tissue plays a primary role in protecting the body from cold and starvation and reducing the cancer risk by its anti-oxidative activity and secretion of tumor necrosis factor (TNF)- α .

In conclusion, from the viewpoint of anti-aging medicine, it is important to maintain balance by avoiding extreme conditions like obesity or emaciation, and extreme caloric restriction.