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Prefatory Note

Relationship between dietitians and National Institute of Health and Nutrition

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Since National Institute of Health and Nutrition was founded in 1920, it has successfully achieved in nutrition-related researches. The relationship between dietitians and the Japan Dietetic Association, and NIHN has been very tight in terms of their position on how to apply research findings on nutrition for nutrition improvement of the Japanese population.

In 1922, the first director, Mr. Tadasu Saeki reported an economic and nutritional menu planning in the paper, and suggested a menu planning in units in 1923. He worked on relief activities drawing on the entire institute for the victims of the Great Kanto Earthquake struck in 1923, including food distribution in various places, and cooking guidance. The institute has been involved in people's life very much to this day through those activities besides academic researches.

Mr. Minoru Katsumata, a member of the House of Councilors, former director-general of Health and Medical Bureau-Ministry of Health and Welfare stated in the preface to 'Japan's Nutrition History' (Hiromichi Hagiwara, National Nutrition Association) as follows; "Japan has been successfully achieved three things in the run-up to the world in nutrition area in past 50 years. First, national institute of nutrition was founded. Second, nutrition conference was founded. Third, dietitians were founded. Dr. Saeki who was best known as a father of nutrition has accomplished those three remarkable achievement".

In addition, Mr. Saeki found the nutritionist training facility in April, 1925, and started training dietitians. He stated the school's concept for people who aimed for nutrition in school's brochure as follows; "Nutrition has to be practiced based on science and ideals, not an armchair theory".

Since then, dietitians' system was improved in several ways; dietitians' rules and Dietitians' Law were established in 1945 and 1947 respectively. In 1962, registered dietitians' system was established. In 2000, pending legislative issues regarding Dietitian's Law was corrected as licensing registered dietitians, and clarifying a special line of work for registered dietitians.

As you know, our country has been asked for improving specialties more and more in the area of healthcare, medical treatment, welfare, and nursing care to respond to the changing times. The role for both registered dietitians and dietitians is wide-ranging as health promotion, prevention of disease, extension of healthy life expectancy by treatment of disease, improvement in quality of life, and contribution to the medical economics. Their expected line of business is becoming more diversified, sophisticated, and specified year by year, and the greatest challenge of all is improvement in their qualification.

On the other hand, health policies such as Health Japan 21, Health Family 21 that Health, Labour and Welfare Ministry is promoting are setting their target values based on scientific basis, and working on health improvement. It is said that nutrition counseling and nutrition education based on the evidence are requirements of times. I am expecting for National Institute of Health and Nutrition with Heizo Tanaka, director-general to develop much further, and give an impact on scientific nutrition education. I am hoping this year to make epoch to public health and nutrition counseling by enactment of the basic dietary education and creation of the nutrition schoolteacher system.

Current Research Projects

Laboratory of Nutritional Biochemistry

Masao Kondo
Division of Applied Nutrition

In our laboratory, 5 main advanced researches and surveys are on going as follows;

- 1) Analysis of Japanese food and life style to keep the immune system sound in improvement of the quality of life for elders
- 2) Development and evaluation of the health index of trace minerals, and the research of the mutual contamination in the living body
- 3) Research on the mechanism of the onset of sports anemia
- 4) Total study on congenital porphyrias; its mechanism of onset, prevention, diagnosis, treatment and daily care and support for the patients
- 5) Researches on the treatment and prevention of various diseases caused by the nutritional factors

For 1), we conduct a variety of researches and studies focusing on many nutritive components of food which balance the immune system to promote the rational way of intakes of those nutrients. Because elder's immune system tend to decrease in function and need to keep up and strengthen with such eating habit.

In 2), we conducted the collaborative research with Chinese government on the non-pollution arseniasis in some area in China to evaluate the affection on human body. Then we spread the monitoring area into where had been thought to be safety areas, and went on the inspections over the people living there about their health, housings, dietary environment, and life styles. We analyzed the trace minerals of people's urine, hair, and soil around houses, and also analyzed those of coals, drinking water and food that are vital to live. As a result, we found that the nutritional disorder and potential arsenic pollution have been increasing. Currently, we are working on various researches, aiming for establishment of medical cure and prevention method of arsenic intoxication.

Furthermore, we had another collaborative research with Ukraine, and surveyed and found the effects of lead on local residents' health which air sprayed in purpose of elimination of radioactivity after the nuclear meltdown at Chernobyl in 1986. This led us to the significant problem that the victims

of the lead exposure possibly exist, other than the radioactive. From now on, we are going to increase the subjects for analysis, and continue the surveys.

About 3), we conducted the sports anemia surveys with the subjects of male intercolligate Hakone Ekiden (a traditional Tokyo to Hakone and back long-distance relay race) runners and female senior high-school basketball players who routinely engaged in intensive exercise. As a result, males were potentially lacking vitaminB12 and folic acid, and females, on the other hand, were lacking iron and being disordered on a group of heme-synthetic enzymes. In addition, many trace minerals were influenced such as lack in zinc and molybdenum and increase in nickel. Currently we are examining the biological significance of these fluctuations of elements.

Congenital porphyria, 4), is the disease that its onset and exacerbation mechanism is deeply related to the environment after birth (gene-environmental factor mutual interference mechanism). Due to its various symptoms, congenital porphyria is easily misdiagnosed, and it is serious enough to cause the patient's death if mistreatment is taken. Our laboratory is the only institute in Japan conducting the totally research on its mechanism of onset, prevention, diagnosis, and treatment, and discussing various aspect of this disease to increase the QOL of the patients. We successfully found that various kinds of porphyrin which increase in the body produce the active oxygen such as OH radical and singlet oxygen. So we recommend the patients to take the antioxidation food and stay out from sunshine, and we continue observing the course.

About 5), we currently research and develop the prevention of anemia, increase of the immune system, and effectiveness of diagnosis and treatment for brain tumor by δ -amino acid.



Research Findings

Do Japanese people have a greater amount of the abdominal visceral fat?

-Examination by the Meta-analysis-

Shigeho Tanaka
Division of Human Nutrition

It is said that the percentage of Japanese people who display the symptoms of life-style related disorders, including diabetes, may increase by gaining their weight slightly, although there are not many greatly overweight people in Japan, compared in the U.S. Therefore, Body Mass Index (BMI) of $25\text{kg}/\text{m}^2$ or more is considered to be obesity in Japan which is quite low, while BMI of $30\text{kg}/\text{m}^2$ or more is so internationally. As one of the reasons for that, it can be speculated that Japanese people may have a greater amount of the abdominal visceral fat. However, there is no scientific evidence to prove it.

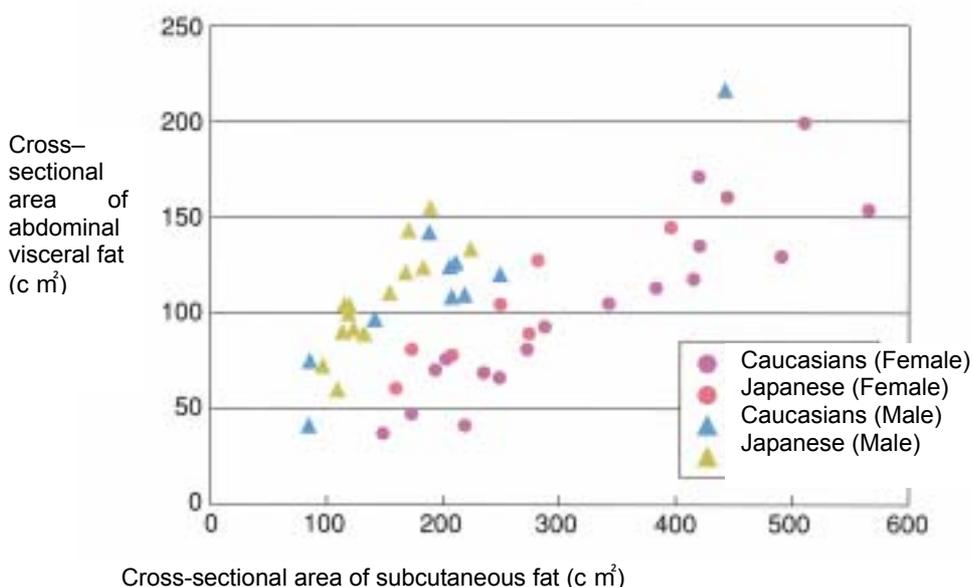
Thus, we decided to compare the cross-sectional area of abdominal visceral fat between Japanese, excluding Japanese-Americans, and Caucasians and African-Americans that has been reported in various references. We searched for the references by using the search systems of medical papers in both English and Japanese. Then we analyzed them that clearly stated averages of the cross-sectional area of abdominal visceral fat and subcutaneous fat, and age and races.

The result is shown as a following graph. The averages of the cross-sectional area of subcutaneous fat are in horizontal axis, and the averages of the cross-sectional area of visceral fat are in vertical axis. The averages of the cross-sectional area of visceral fat of Japanese are almost as same as Caucasians. But the averages

of the size of the cross-section area of abdominal subcutaneous fat of Japanese are much lower than Caucasians. So, we adjusted for gender and mean age. As a result, we found that the cross-sectional area of visceral fat of Japanese is about 15c m^2 larger than Caucasians if the cross-section area of abdominal subcutaneous fat are the same. As the graph shows, many dots of Japanese exist at an upper area to the regression line. However, when we perform the same analysis, adding African-Americans, the adjusted value of the abdominal visceral fat for African-Americans are about 38c m^2 lower than that for Caucasians. Compared to that, the difference between Japanese and Caucasians are less than a half.

Recently, another research group obtained a similar result on Asians, mainly Japanese-Americans, who lived in the U.S. that they accumulated more of abdominal visceral fat. Although there are some problems in a meta-analysis such as difference in measurement method, it is concerned that Japanese people accumulate more of the abdominal visceral fat by a nature as well as a difference in living environment.

Source: Tanaka S, Horimai C, Katsukawa F. Ethnic differences in abdominal visceral fat accumulation between Japanese, African-Americans, and Caucasians: a meta-analysis. Acta Diabetol: 40: S302-S304, 2003



Averages of the cross-sectional area of abdominal visceral fat and subcutaneous fat