Wednesday Afternoon

SYMPOSIUM 'GERONTECHNOLOGY IN THE PREVENTION OF SENILE DEMENTIA, PHYSICAL INACTIVITY, AND PSYCHOLOGICAL DEGENERATION'; CHAIR: MASARU MIYAO (JAPAN)

Effects of physical exercise on the decreased insulin action caused by aging

Y. Sato
Aichi Gakuin University, Japan; e-mail: satoy@dpc.aichi-gakuin.ac.jp

It is commonly accepted that general physiological capacity decreases with age. For example, basal metabolic rate, renal function, maximal breathing capacity, maximal oxygen uptake (VO2max) and in vivo insulin action decline as a person grows older. However, numerous cross-sectional and longitudinal studies have shown that continued exercise training may slow the rate of the age-related decline in VO2max. On the other hand, aging is also characterized by a loss of functional reserve capacity (reserve capacity is defined as the difference between basal and maximal function). In recent years the average life expectancy has become longer and the size of the elderly population has greatly increased. Therefore, maintenance of better quality of life (QOL) in the elderly has become a more pressing concern. This keynote lecture will discuss possible mechanisms of the beneficial effects of physical training on declining physiological functions, chiefly focusing on glucose intolerance in elderly subjects. Regardless of the benefits of exercise, however, it is difficult for aged subjects to continue physical exercise for a long time. We recently investigated the effects of passive exercise on insulin sensitivity in elderly diabetic patients using a therapeutic horseback riding device (Joba-R). The results showed that passive exercise training in diabetic patients significantly enhanced the lower level of insulin-induced glucose uptake. The Joba-R apparatus might be a useful therapeutic device not only for the improvement of insulin resistance but also for the prevention of senile dementia.

Strategy for prevention of Alzheimer's disease

H. Umegaki
Department of Geriatrics, Nagoya University Graduate School of Medicine, Japan; e-mail: umegaki@tsuru.med.nagoya-u.ac.jp

Alzheimer's disease is a progressive neurodegenerative disease and the leading cause of dementia. Although the number of patients has risen dramatically in many developed countries, the treatment for this disease remains very limited at present. In recent years, however, basic research in this field has made significant progress toward elucidating the pathological mechanism of Alzheimer's disease. Meanwhile, epidemiological studies have identified risk factors for this disease including diabetes, hypertension, and hyperlipidemia. These achievements have suggested possibilities for the prevention of this disease either by pharmacological intervention or life-style modification. In this symposium we will review the current status of Alzheimer's disease prevention and discuss future strategies.

Effect of traditional Chinese (Kampo) medicine on the prevention of diabetic complications

B. Qin
Faculty of Psychological and Physical Sciences, Aichi Gakuin University, Japan; e-mail: bolin@med.nagoya-u.ac.jp

Diabetes is one of the risk factors for dementia. Recently, traditional Chinese (Kampo) medicine has been re-evaluated in terms of its efficacy and undergone increased popularity around the world because of its supposedly less frequent side effects compared with modern Western medicine. We investigated the effects of two kinds of Chinese herbal medicine, Goshajinkigan (GJG) and Keishikajutsubuto (KJT), on the subjective symptoms of diabetic neuropathy and insulin resistance. Our recent studies suggest that (i) GJG is a useful medicine for amelioration of diabetic neuropathy, and (ii) GJG and KJT are effective in improving insulin action in diabetic animals. Based on our previous studies and studies of others, we propose that diabetic complications can be positively controlled with the use of traditional Chinese (Kampo) medicine, such as GJG, or other herbal medicines.

Well-being & dementia: the role of assistive technologies

A. Sixsmith*, R. Orpwood**, J. Torrington***, P. Clarke*, G. Gibson*
*Division of Primary Care, University of Liverpool, Liverpool;
**BIME Wolfson Centre Royal United Hospital Bath, University of Bath;
***Department of Architecture, University of Sheffield, Sheffield, United Kingdom; e-mail: sixsmith@liv.ac.uk

This paper considers the role of assistive technology (AT) in improving the quality of life of people with dementia. While AT has been shown to have a significant impact on improving the safety and security, less work has been conducted which examines the role of AT in contributing to well-being and quality of life. However leisure, social and other activities can and do have a profound impact upon well-being and quality of life amongst people with dementia. The paper outlines the findings of a qualitative study examining issues and activities relating to well-being amongst people with dementia, and the contexts within which AT devices may be developed in order to improve quality of life. Using a concept model of well-being, this paper reveals how participation in a variety of activities may contribute to sense of well-being, subsequent quality of life, and meanings derived from taking part in an activity. This paper concludes with implications for the design and use of AT devices within this arena, with particular attention to the requirements and needs of people with dementia and their formal and informal carers.

Computer-assisted stimulating activities for persons with dementia

S. H. Tak*, C. Beck**
*College of Nursing, University of Arkansas for Medical Sciences;
**College of Medicine, University of Arkansas for Medical Sciences, USA;
e-mail: taksunghee@uams.edu

The purpose of the study is to examine the effect of computer-assisted stimulating activity on cognitive function in elders with dementia. Preserving cognitive ability is critical for maintaining activities of daily living and staying socially connected with others. Multi-sensory activities are known to stimulate a person's cognitive processes, reduce the risk of dementia, and diminish boredom and excessive unstructured time in elders. However, activities can be frustrating, uninteresting, and meaningless unless they fit the competencies, preferences, and needs of persons with dementia. Tailoring activities is important to make them meaningful and increase participation and satisfaction with the activity. Advances in computer technology provide the capacity to systematically individualize multi-sensory stimulating activities to persons' cognitive and functional ability while meeting elders' needs for enjoyment and possibly providing relief for caregivers. This research study uses computers to provide elders with dementia multi-sensory stimulation that can be repeated on demand, interactive with value-free instant feedback, and modified in speed and level of cognitive challenges. This pilot project is developing a standardized decision-making algorithm (dosage, frequency, and content of stimulation) and practice guidelines for tailoring computer-assisted stimulating activities in elders with dementia.

Vision care for the aged

Y. Takayanagi*, M. Miyao**
*Hongo Clinic of Ophthalmology & Neurology; Nagoya University School of Medicine; **Information Technology Center, Nagoya University, Japan;
e-mail: yataka@yacht.ocn.ne.jp

Japan today is a rapidly aging society, with a mean life span for males of 78 years, and for females 85 years. Since I opened my clinic in 1973, I have been involved in vision care for aged people and ophthalmologic rehabilitation for visually impaired persons. The vision of older people is of course poorer than that of people in their youth. However, there is no way to prevent the effects of age, and we should accept the physiological changes that occur over our lives. The prescription of visual aids based on an accurate test of refraction and accommodation will lead to a better visual life for most elderly people. Use of eyeglasses can also help prevent senility.