Report

Influences of exercise and eating habits during student age on lifestyle-related diseases in middle age, based on the male alumni of Juntendo University

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Abstract

Continuation of appropriate physical activity is said to be important to prevent the lifestyle-related diseases. But there are also reports about the short life expectancy caused by heart diseases among people who had active exercise habits in young age, such as among retired sports players. In this study male Juntendo alumni were asked by means of the questionnaires about their exercise and eating habits during their student age in order to reveal the influence on lifestyle-related diseases in middle age.

Altogether 896 replied to the questionnaires. The comparison of the alumni of the faculty of physical education with the alumni of the faculty of medicine and the results of the logistic regression analysis showed no influence of eating and exercise habits during student age on the lifestyle-related diseases in middle age.

The preceding studies have reported that the history of exercise performed in the past does not prevent diseases. Among the male Juntendo alumni it has been suggested that eating and exercise habits during student age did not influence the lifestyle-related diseases in middle age.

Key words: lifestyle-related diseases, Alumni study, Eating habit, Exercise habits

1. Introduction

The lifestyle-related diseases are reported to be possible to be prevented by continuing proper physical activity, non-smoking, moderate drinking, keeping adequate diet balance and maintaining appropriate body weight.

However, there are reports revealing that even former sports players who have habitually practiced exercise for long time since youth age, are taken ill with the cancer and heart diseases and their life expectancy is shorter than the average of the general public[9)10)]. Reports are also found in Japan indicating that the former students of the faculty of physical education and professional and amateur athletes become ill with illnesses like heart diseases and die earlier than the former student of the other faculties and people of other occupations[2)3)].

This study might reveal the association between exercise and eating habits during student age and the history of the lifestyle-related diseases in middle age, in the investigation of both exercise and eating habits during student age of the alumni of the Juntendo University, the university having both the faculty of physical education and the faculty of medicine, where a big difference in amount of exercise has been expected among the alumni in student age of the both faculties.

2. Methods

The subjects of this study consist of the Juntendo alumni whose name and address are registered in

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the Keiyukai alumni list of the faculty of physical education and in the alumni list of the faculty of medicine.

The group of the subjects is composed of the alumni of the graduation years from 1956, the first year of the graduation of the faculty of physical education, to 1976. The alumni of the faculty of medicine are between 1956 and 1978 in order to adjust the age to the other group.

The number of the possible subjects consists of 1467 alumni of the faculty of physical education and 1033 alumni of the faculty of medicine. In that period, the faculty of physical education had been restricted to male students, and therefore the subjects of the faculty of medicine have been also limited to the male alumni in this study.

Questionnaires have been sent by May, 2008. The questionnaires returned by June, 2008, have been evaluated in this study.

The items of the questionnaire were (1) the profiles of the subjects: age, height, weight, belly size, occupation, (2) life style habits: sleeping hours, walking steps, stairs stepped, smoking habits, drinking habits, (3) eating habits: student age and present, (4) exercise habits: student age and present, and (5) the history of the doctor-diagnosed disease. The subjects have been requested to make a description of all of these items.

Concerning eating habits, the recall method has been applied to recollect and describe the menu the subjects had had for breakfast, lunch and dinner during student age, and the brief-type self administered diet history questionnaires: BDHQ have been used to research present eating habits.

Concerning exercise habits, following items have been asked. Sports club activity in university —yes or no—, if yes, in which sports club, frequency of activity in a week, and duration of activity per day. And for present items, active physical, exercise, gymnastic, recreation, etc. —yes or no—; list of all kinds of physical activity have been practiced, frequency of that activity, and duration of exercise of each activities.

Concerning the doctor-diagnosed disease, the subjects had answer yes or on for diseases: hypertension, diabetes mellitus, dyslipidemia, cardiovascular diseases (angina pectoris, myocardial infarction, other ischemic heart diseases and other cardiac diseases), cerebrovascular diseases (cerebral infarction, cerebral hemorrhage and other cerebrovascular diseases), liver disease and pulmonary function insufficiency. If the listed diseases have existed, the subjects have been requested to describe the age of diagnosis and present status of the treatment.

Six illnesses have been chosen for representative lifestyle-related diseases: hypertension; diabetes mellitus; dyslipidemia; ischemic heart diseases (angina pectoris, myocardial infarction and coronary artery aneurysm); cerebrovascular diseases (cerebral infarction, cerebral hemorrhage and cerebral aneurysm) and cancer. And the amount of the calorie intake by meals (kcal/day) had been calculated by means of Healthy Maker Pro510 (mushroomsoft co. ltd) representing eating habits during student age, and duration of activity of university sports club (hours/day) had been calculated from the product of frequency of activity of university sports club during a week, and duration of one activity representing exercise habits during student age have been selected as investigation factors in this study on the basis of the questionnaire. Eating and exercise habits during student age have been applied to the recall method.

The influence of eating and exercise habits during student age on the lifestyle-related diseases in middle age has been examined by means of the logistic regression analysis. The present age, the graduated faculty, smoking and drinking habits during student age has been added to the investigation factors. SPSS (Version 11.5), the software for statistics, has been applied for the logistic regression analysis.

3. Results

908 alumni sent back the questionnaires. (The collection rate was 36.5%.) The subjects of analysis of this study were a total of 896 alumni (Age 63.4±6.1 years; BMI 23.8±2.6; belly size 84.7±6.5

Table 1　Characteristics of the subjects
Table are expressed as mean and standard deviation. A P value of 0.05 or less is considered to indicate statistical significance.

	All alumnus (n＝896)	Alumnus of the faculty of the physical education (n＝627)	Alumnus of the faculty of the medicine (n＝269)	probability
Age (year)	63.4±6.1	62.7±5.6	65.0±6.9	*0.000
BMI	23.8±2.6	23.8±2.6	23.7±2.6	0.506
Belly size (cm)	84.7±6.5	84.3±6.5	91.3±6.5	*0.003
working (%)	69.6	58.5	95.2	*0.000

* Age, BMI, Belly size and working had been compared and discussed by means of the t-test and the crosstabs. (Alumnus of the faculty of the physical education vs Alumnus of the faculty of the medicine)
Abbreviations; BMI: body mass index, cm: centimetre.

Table 2　Eating habits and exercise habits student age
Table are expressed as mean and standard deviation. A P value of 0.05 or less is considered to indicate statistical significance.

	All alumnus (n＝896)	Alumnus of the faculty of the physical education (n＝627)	Alumnus of the faculty of the medicine (n＝269)	probability
The amount of the caroly inteke of meals (kcal/day)	1941.0±441.3	2002.4±428.1	1801.2±440.0	*0.000
The duration of activity of university spors culb (hours/day)	1.8±1.1	2.0±0.9	0.6±0.7	*0.000

* The amount of the caroly inteke of meals and the duration of activity of university spors culb had been compared and discussed by means of the t-test and the crosstabs. (Alumnus of the faculty of the physical education vs Alumnus of the faculty of the medicine)

Table 3　Previous illness rate with lifestyle related disease
Table are expressed as mean and standard deviation. A P value of 0.05 or less is considered to indicate statistical significance.

	All alumnus (n＝896)	Alumnus of the faculty of the physical education (n＝627)	Alumnus of the faculty of the medicine (n＝269)	probability
Life style related diseases	53.1	53.1	53.2	0.524
Hypertension	31.3	31.4	30.9	0.466
Diabetes Mellitus	12.2	12.6	11.6	0.313
Dyslipidemia	18.3	17.5	20.1	0.210
Ischemic heart disease	6.9	6.5	7.8	0.290
Cerebrovascular disorder	4.8	5.7	2.6	*0.028
Cancer	6.3	5.7	7.4	0.207

* The incidence of the history of the lifestyle-related diseases of the alumni having reached middle age had been compared and discussed by means of the t-test and the crosstabs. (Alumnus of the faculty of the physical education vs Alumnus of the faculty of the medicine)

cm.).【Table. 1】

The mean of the amount of the calorie intake by meals during student age was 1941±441.3 kcal/day. And duration of activity of university sports clubs was 1.8±1.1 hours/day. The amount of the calorie

Table 4 The influence of eating habits in student age on lifestyle related diseases
Table are expressed as adjusted odds ratio and 95％confidence interval by the logistic regression analysis. A P value of 0.05 or less is considered to indicate statistical significance.

	adjusted odds ratio	95％confidence interval	probability
Lifestyle–related diseases	1.000	1.000～1.000	0.932
hypertension	1.000	1.000～1.000	0.898
diabetes mellitus	0.999	0.999～1.000	0.094
dyslipidemia	1.000	0.999～1.000	0.179
ischemic heart disease	1.000	0.999～1.001	0.739
cerebrovascular disease	1.001	1.000～1.002	0.122
cancer	1.000	0.999～1.001	0.753

* The present age, graduated faculty, smoker in student age, dorinking in student age and exercise habits in student age had been added to the investigation factors.

Table 5 The influence of exercise habits in student age on lifestyle related diseases
Table are expressed as adjusted odds ratio and 95％confidence interval by the logistic regression analysis. A P value of 0.05 or less is considered to indicate statistical significance.

	adjusted odds ratio	95％confidence interval	probability
Lifestyle–related diseases	0.996	0.969～1.024	0.784
hypertension	1.015	0.986～1.045	0.321
diabetes mellitus	0.992	0.951～1.035	0.711
dyslipidemia	0.990	0.956～1.024	0.551
ischemic heart disease	0.976	0.923～1.032	0.396
cerebrovascular disease	1.008	0.943～1.077	0.817
cancer	0.953	0.898～1.012	0.118

* The present age, graduated faculty, smoker in student age, dorinking in student age and eating habits in student age had been added to the investigation factors.

intake by meals during student age and duration of activity of university sports clubs of the alumni of the faculty of physical education were significantly higher than the other group ($P<0.05$).【Table. 2】

The numbers of the alumni and the incidence of the lifestyle-related diseases were 476 (53.1％). There was no difference in the incidence of the lifestyle-related diseases and in the incidence of respective illnesses, except for cerebrovascular diseases, between the alumni of the two faculties. The alumni of the faculty of physical education showed significantly higher incidence of cerebrovascular diseases ($P<0.05$).【Table. 3】

Referring the logistic regression analysis, the influence of eating and exercise habits during student age on the history of the lifestyle-related diseases has not been found. There has also been no influence of eating and exercise habits during student age on respective illnesses of the lifestyle-related diseases.【Table. 4】【Table. 5】

4. Discussion

These results accord with the reports of Montoya et al.[1], Olson et al.[4] and Quinn et al.[8], showing there were no relationships between the history of exercise in young age, and the age and the reason of death. This study deals with the relationship with the lifestyle-related diseases. But this study can be regarded as similar to the studies on the age of death and the life expectancy, because the lifestyle-related diseases such as hypertension, diabetes mellitus and dyslipidemia can trigger for lethal illness, and

ischemic heart diseases, cerebrovascular disorders and cancer can be mortal.

According to the Harvard Alumni Health Study the tendency of the association has been reported between little exercise habits in student age and the state of being taken ill in middle age[5)〜7)10)]. The Harvard Alumni Health Study made comprehensive survey including health conditions such as blood pressure and heart rate, proportion of height and body weight, the history of diseases of parents, etc[5)〜7)10)]. Moreover, the Harvard University is a general university and the subjects of the survey were the alumni of various faculties. Compared to it there is a bias in this study because the alumni of the two characteristic faculties of physical education and medicine were the subjects.

Survey response rate is 35%, therefore this date was a part Juntendo alumni. And, in particular, I can expect this questionnaire had replied by relatively a stable health and diseases many high interested participants because this questionnaire had been to investigate personal disease.（Self-selection bias）Also, eating habits, exercise habits during student age student age were surveys by recalled and cannot avoid also recall bias. That should reduce the bias of these very problems in the future.

（This paper is based on the master's thesis submitted to the Graduate School of Health and Sports Science, Juntendo University.）

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（平成21年12月 4 日　受付
平成22年 2 月16日　受理）