The Effect of the Treatment on the Risk Factors of Arteriosclerotic Diseases in the Elderly: Investigating the Specific Health Checkup

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Abstract

Few reports exist on the outcome of health checkups in the elderly. We conducted an investigation of the specific health checkup to clarify whether or not the risk factors of arteriosclerotic diseases in the elderly had been treated.

The subjects consisted of 478 elderly people selected from a larger group of 638 participants aged 65 years and older who underwent the specific health checkup at our hospital's Health Care Center from April 1, 2013 to March 31, 2014 (this study). The investigation items were blood pressure, blood tests [triglyceride level, HDL cholesterol, LDL cholesterol, HbA1c (NGSP)], changes in the condition, and therapeutic regimen.

(1) Dyslipidemia [triglyceride level $\geq 150\text{mg/dL}$ or HDL cholesterol $< 40\text{mg/dL}$ or LDL cholesterol $\geq 140\text{mg/dL}$]: 38.4% were indicated as having had dyslipidemia the preceding year. A total of 22.8% ($p < 0.01$) underwent drug therapy from the preceding year onwards, and among these, improvement was observed in 47.6% regarding this study. (2) Hypertension [systolic blood pressure $\geq 140\text{mmHg}$ or diastolic pressure $\geq 90\text{mmHg}$]: 34.7% were indicated as having had hypertension the preceding year. A total of 59.0% underwent drug therapy from the preceding year onwards, and among these, improvement was observed in 40.8% regarding this study. (3) Diabetes [HbA1c (NGSP) $\geq 6.5\%$]: 6.9% were indicated as having had diabetes the preceding year. A total of 60.6% underwent drug therapy from the preceding year, and among these, improvement was observed in 20.0% regarding this study.

It was suggested that commencing active treatment against dyslipidemia in the elderly and carrying out appropriate control of hypertension and diabetes were necessary. A specific advantage of being able to understand the outcome of patients who have not undergone treatment, which is unknown in actual clinical practice, may be achieved by conducting follow-ups regarding the status of the health checkup.

Key words

Elderly, health checkup, dyslipidemia, hypertension, diabetes

Introduction

Detecting the risk factors of lifestyle-related diseases early and preventing the onset thereof help to extend the independent life and shorten the essential long-term care of the elderly. The basic health checkup of the Health and Medical Service Law for

the Aged (hereinafter referred to as the basic health checkup for the elderly) is a health checkup unique to Japan, with citizens aged 65 years or older as the subjects, and the specific health checkup was commenced from 2008. However, there are still very few reports regarding the status of health checkups in the elderly, and follow-up investigation reports are rare.

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At the same time, there are many reports on the treatment course of the risk factors of arteriosclerotic diseases in actual clinical practice. However, the outcome of patients who have not undergone treatment, regardless of being indicated with abnormalities, is unknown in actual clinical practice.

In the present study, an investigation was carried out on the specific health checkup to clarify whether or not dyslipidemia, hypertension, and diabetes found in the elderly during a health checkup had been treated and improved.

Methods

The subject institute was the Health Care Center at St. Marianna University Hospital, a facility accommodating 1,208 beds (hereinafter, our hospital). Most of our 478 subjects were patients who were living in the vicinity of our hospital, patients who had been referred from other hospitals, and patients who were visiting our hospital as outpatients. All patients had continuously undergone the specific health checkup since the preceding year and had come from a larger pool of 638 people aged 65 years or older, all of whom had undergone the specific health checkup during the year from April 2013 to March 2014.

Regarding the method, medical records and reports on the results of the specific health checkup were used to investigate the following items: blood pressure in the examination room, blood tests [triglyceride level, HDL cholesterol, LDL cholesterol,

HbA1c (NGSP)], change in the condition, and therapeutic regimen.

The research design was a retrospective study. Using the χ^2 test, a level of significance of 5% or less was determined as having a significant difference. The present study was carried out upon receiving approval from the ethics committee of our university (Authorization number 2718).

Results (Table)

The subjects were as follows: 221 men and 257 women, averaging 76.6 ± 5.5 years old. Eighteen patients had a history of ischemic heart disease, and 25 patients had a history of cerebrovascular disease.

1. Regarding the incidence of abnormalities being indicated and the presence of drug therapy from the preceding year onwards.

Dyslipidemia was determined when triglyceride level $\geq 150\text{mg/dL}$ or HDL cholesterol $< 40\text{mg/dL}$ or LDL cholesterol $\geq 140\text{mg/dL}$. A total of 38.4% of the subjects were indicated with dyslipidemia the preceding year. A total of 22.8% ($p < 0.01$) of patients underwent drug therapy with an indication of abnormalities the preceding year.

Hypertension was determined when systolic blood pressure $\geq 140\text{mmHg}$ or diastolic pressure $\geq 90\text{mmHg}$. A total of 34.7% of the subjects were indicated with hypertension the preceding year. A total of 59.0% of patients underwent drug therapy with an indication of abnormalities the preceding year.

Table Incidence of Abnormalities, Presence of Drug Therapy, and Improvement

	Dyslipidemia [†]		Hypertension [‡]		Diabetes [§]	
	no./total no.	(%)	no./total no.	(%)	no./total no.	(%)
With indication	184/478	(38.4)	166/478	(34.7)	33/478	(6.9)
With drug therapy from the preceding year onwards	42/184**	(22.8)	98/166	(59.0)	20/33	(60.6)
Improved in this study [¶]	63/184	(34.2)	69/166	(41.6)	8/33	(24.2)
With drug therapy	20/42	(47.6)	40/98	(40.8)	4/20	(20.0)
Without drug therapy	43/142	(30.3)	29/68	(42.6)	4/13	(30.8)

** $p < 0.01$

[†] triglyceride level $\geq 150\text{mg/dL}$ or HDL cholesterol $< 40\text{mg/dL}$ or LDL cholesterol $\geq 140\text{mg/dL}$

[‡] systolic blood pressure $\geq 140\text{mmHg}$ or diastolic pressure $\geq 90\text{mmHg}$

[§] HbA1c (NGSP) $\geq 6.5\%$

[¶] The percentage at which each item indicated with abnormalities the preceding year came within the standard value

Diabetes was determined when HbA1c (NGSP) $\geq 6.5\%$. A total of 6.9% of the subjects were indicated with diabetes the preceding year. A total of 60.6% of patients underwent drug therapy with an indication of abnormalities the preceding year.

2. Relationship between an improvement in this study and the presence of drug therapy from the preceding year onwards.

Patients were determined as having “improved” when the subjects identified as having had dyslipidemia the preceding year had triglyceride level $< 150\text{mg/dL}$, HDL cholesterol $\geq 40\text{mg/dL}$, and LDL cholesterol $< 140\text{mg/dL}$ in this study. Improvement was observed in 34.2% of patients who indicated with dyslipidemia the preceding year. Moreover, improvement was observed in 47.6% of the subjects in this study among the group that had undergone drug therapy (hereinafter, the treated group), while improvement was observed in 30.3% of the subjects in this study among the group that had not undergone drug therapy (hereinafter, the untreated group) ($p=0.0581$).

Patients were determined as having “improved” when subjects identified as having had hypertension the preceding year had systolic blood pressure $< 140\text{mmHg}$ and diastolic pressure $< 90\text{mmHg}$ in this study. Improvement was observed in 41.6% of patients who indicated with hypertension the preceding year. Moreover, improvement was observed in 40.8% of the treated group in this study.

Patients were determined as having “improved” when the subjects identified as having had diabetes the preceding year had HbA1c (NGSP) $< 6.5\%$ in this study. Improvement was observed in 24.2% of patients who identified as having had diabetes the preceding year. Moreover, improvement was observed in 20.0% of the treated group in this study.

Discussion

We have been conducting an investigation into the effectiveness of the basic health checkup for the elderly and reported thereon. Among the subjects identified as having some form of abnormality or disease (dyslipidemia, hypertension, diabetes, liver dysfunction, renal dysfunction, or anemia) during basic health checkups for the elderly, the group with a primary care doctor had significantly more cases in which improvement was observed the following year, compared to the group without¹⁾. Moreover, although significant improvement was observed in the group with a primary care doctor among early elderly peo-

ple (65~74 years old), no significant difference was observed in late elderly people (75 years old or older)²⁾. In the present study, we investigated whether or not the elderly undergo treatment after being indicated with dyslipidemia, hypertension, or diabetes during a health checkup, as well as the outcome of improvement.

The rate of patients who underwent drug therapy for dyslipidemia was 22.8%, which was significantly small compared to that of hypertension and diabetes. Reports on whether or not treatment was carried out following health checkup examinations are rare, making comparisons with other facilities difficult. Regarding the current status in which drug therapy is not being carried out regardless of being indicated with dyslipidemia, it has been suggested that hypertension treatment is given priority and dyslipidemia treatment is therefore delayed³⁾. Moreover, it has been reported that the therapeutic purpose of dyslipidemia is not being sufficiently communicated between doctors and patients⁴⁾. Further, it is surmised that doctors may not understand the necessity for dyslipidemia treatment in the elderly. In the present study, while there was no significant difference in dyslipidemia overall, improvement in the treated group tended to be higher when compared to the untreated group. In a report of subjects with an average age of 62 years³⁾, the therapeutic goal achievement rate of hyper-LDL cholesterolemia was 70.4%. In the present study, focusing only on hyper-LDL cholesterolemia, improvement was observed in 76.0% (19 among 25 patients) of the treated group, while improvement was observed in 30.1% (31 among 103 patients) of the untreated group, with hyper-LDL cholesterolemia significantly improving through treatment ($p < 0.001$). Reports investigating the status of health checkups are rare and cannot be easily compared; moreover, because the average age in our study was approximately 14 years older than that reported by Teramoto et al., it may be possible to expect improvement of hyper-LDL cholesterolemia even in the elderly. In a study with subjects aged 70~89 years old, there was a correlation between total cholesterol level and death caused by ischemic cardiovascular disease⁵⁾. Moreover, it was indicated that the risk of death due to coronary artery disease and nonfatal myocardial infarction declined by administering statin for 3 years among patients aged 70~82 years old⁶⁾. Significant cardiovascular event suppressing effects and a significant decline in the risk of cerebral stroke were also noted after statin administration in patients aged 70

years old or older⁷⁾. Sufficient research has not yet been carried out regarding the management of dyslipidemia in late elderly people aged 75 years old or older, who accounted for many subjects in the present study. It has been mentioned that in ischemic cardiovascular disease secondary preventive patients, commencing drug therapy for dyslipidemia should be considered for late elderly people with high social activity⁸⁾, and such understanding is necessary for both the doctor and patient. Based on the low rate of patients who have undergone drug therapy, regardless of the high improvement in the treated group, it was suggested that there is a need for active drug therapy against dyslipidemia in the elderly.

Regarding hypertension, although the percentage of people who underwent drug therapy was greater than half at 59.0%, an improvement in the treated group was observed in 40.8% of patients in this study. Teramoto et al.³⁾ reported that the target achievement rate of decline in hypertension patients with an average age of 65 years was 50.0%. Because improvement in the treated group and untreated group was substantially the same in the present study, it is clear that blood pressure control in the treated group is insufficient. Regarding hypertension, it is believed that therapeutic effects are less likely to be observed compared to dyslipidemia, or a variety of symptoms and organ disorders may occur when the blood pressure drops too much; therefore, the target level is not strictly controlled. From this fact, it may be said that it is necessary to be aware of whether or not the blood pressure is appropriately controlled in addition to, of course, carrying out drug therapy against hypertension in the elderly.

Regarding diabetes, the percentage of people who underwent drug therapy was greater than half at 60.6%. Fujita et al.⁹⁾ reported that the rate of achieving the HbA1c management target (HbA1c (JDS) <6.5%) among diabetic patients averaging 70 years of age in actual clinical practice is 52.8%. In the present study, when adjusted according to the report by Fujita et al. due to the difference in the management target level, the rate of achieving the management target in the present study was 45.0% (9 among 20 patients). Regarding diabetes, it was believed that the target level is not strictly controlled because therapeutic effects are less likely to be observed compared to dyslipidemia, or there is a danger of hypoglycemia due to treatment. From this fact, it may be said that it is necessary to be aware of whether or not blood sugar levels are appropriately controlled in ad-

dition to, of course, carrying out drug therapy against diabetes in the elderly.

An improvement in the untreated groups of dyslipidemia, hypertension and diabetes was observed in from 30~40% of the subjects evaluated in this study. It is surmised that the subjects identified to have some disease during the preceding year strived to change their lifestyle without drug therapy after the explanation about results of their health checkup. However, follow-up examinations other than the specific health checkup is necessary, and it is important for the subjects to understand this point.

It is believed that hypertension in old age is involved in the onset of cognitive impairment and dementia including Alzheimer's disease¹⁰⁾, and antihypertensive therapy may be an effective method for preventing the onset of dementia¹¹⁾. Moreover, diabetes has been reported as having a strong relation with Alzheimer's disease, along with vascular dementia¹²⁾. Accordingly, the treatment of the risk factors of arteriosclerotic diseases in the elderly is important in terms of preventing dementia, a problem peculiar to the elderly, and not only for preventing coronary artery diseases and cerebral stroke.

The present study was limited in that the types and dosage of therapeutic drugs are unknown because it was a retrospective study. It is believed that investigating the onset of arteriosclerotic diseases, such as myocardial infarction and cerebral infarction, is necessary by observing the long-term course.

Conclusion

The necessity of actively commencing treatment against dyslipidemia in the elderly and appropriately controlling hypertension and diabetes was suggested. By conducting follow-ups on the status of the health checkup, we may be able to understand the tendency of patients who have not undergone treatment, despite being identified as having certain abnormalities. Health checkups become a trigger to encourage the elderly to undergo treatment for the risk factors of arteriosclerotic diseases, and due to the intervention of actual clinical practice, they may also contribute to preventing the advancement of arteriosclerosis.

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