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Lifestyle Habits Adjustment for Hypertension and Discontinuation of Antihypertensive Agents

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Abstract

Background: Hypertension is one of lifestyle-related diseases, and prevention and effect of reduction pressure can be expected by non-pharmacological interventions. Authors have continued guidance of adjustment for lifestyle to thousands of hypertensive patients, resulting 4.6%-6.1% case could discontinue hypertensive agents. This study enrolled patients with all necessary related data.

Subjects and methods: Subjects were 50 patients with hypertension (M/F: 25/25, age 65.4 ± 8.6 vs. 53.4 ± 6.2 years, BMI 23.4 ± 2.7 vs. 22.3 ± 2.5, respectively), who could discontinued antihypertensive agents. They received consultation and intervention from registered dietitian nutritionists, exercise therapists and nurses.

Results: The comparative results on males and females are as follows: smoking habit was 76% vs. 0%, alcohol intake was 60% vs. 0%, diabetes complication was 16% vs. 8%, and hyperlipidemia was 32% vs. 52%, respectively. These cases showed rare to none incidence of cerebral vascular accident (CVA), coronary heart disease (CHD) and chronic kidney disease (CKD). Consultations in median were 4.0 vs. 4.0 times, median weight reduction was 2.2 kg vs. 1.6 kg and median period withdrawal of the drug was 2.0 years vs. 2.5 years.

Discussion and conclusion: When living adjustment is advised, blood pressure decreases due to behavior change. Our results suggest that these cases have less arteriosclerosis development, which enables withdrawal of medicine. It is necessary to carefully observe the progress whether the antihypertensive drug will be unnecessary or will be restarted. Current results obtained would become the fundamental data in the future, and the adjustment for diet and exercise would be useful for more adequate treatment for hypertension.

Keywords: Hypertension; Antihypertensive agents; registered dietitian nutritionist; Non-pharmacological interventions; Lifestyle habits adjustment

Abbreviations: CVA: Cerebral Vascular Accident; CHD: Coronary Heart Disease; CKD: Chronic Kidney Disease; ARB: Angiotensin II Receptor Blocker; T2DM: Type 2 Diabetes Mellitus; TOHP: Trials of Hypertension Prevention; AHEAD: Action for Health in Diabetes; DASH: Dietary Approaches to Stop Hypertension; PATHS: Prevention and Treatment of Hypertension Study; ARB: Angiotensin II Receptor Blocker.

Introduction

Hypertension has been a health problem to be dealt with in the clinical setting because there are many patients in various countries around the world. Therefore, guidelines regarding hypertension and cardiovascular disease have been announced in North America, Europe, Japan and others [1-5]. There are also guidelines on young people, lipids and obesity, including contents related to hypertension and cardiovascular disease [6-9]. Therefore, treatment of hypertension would be comprehensively utilized using these guidelines for management.

As to hypertension, treatments include administration of drugs as well as treatment without medication. The latter is called non-pharmacological therapy, which has to be originally given to all patients with hypertension. It is especially effective for prevention of hypertension, including for management of mild hypertensive subjects [10]. If we can mildly lower the blood pressure of the general population, it seems to bring health benefits to public health as well [11].

For hypertension treatment, we should not start with administration of antihypertensive drugs, in cases without hypertensive complications. When starting treatment, firstly investigate and grasp the situation of lifestyle habits. Then, the patients can be advised to change proper diet and exercise in the daily life. It is adequate process to start drug administration after that, and this flow becomes the basis of hypertension treatment.

Actually, it is also described in Japanese guideline 2014 as follows. "Hypertension is one of lifestyle-related diseases, and prevention of hypertension and effect of reduction pressure can be expected by modifying lifestyle habits" [5]. In this way, it is very crucial and effective to respond to lifestyle modification, corresponding to each patient by guidance and intervention.

However, the actual medical practice is far from the ideal situation. In hypertensive medical treatment, administration of drugs is the main

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focus. On contrast, guidance and intervention of adjustment of lifestyle is not important, and it is difficult to perform in daily practice. The reasons are that the medical staffs are busy, economic problems related to insurance medical treatment, and the like.

What is the kind of profession that can properly teach patients based on medical knowledge about meals and exercise? They are registered dietitian nutritionist, physiotherapist, and health exercise therapist and so on. In clinical practice, medical treatment including this guidance is desired, but extremely few medical institutions actually continue.

On the other hand, our staffs believe that adjustment of lifestyle habits is essential for all patients and practiced for 14 years since opening the clinic. Even if personnel expenses are required more, necessary staffs are hired, and team medical care is continued. Then, we have intervened appropriately in the patient's lifestyle and have been passionate about advising and teaching living adjustments.

As a team medical care, registered dietitian nutritionist, health exercise therapist and registered nurse have always practiced dietary adjustment and exercise therapy for the patients. We also have taken advantages of three books on hypertension management [12-14]. As a result, among thousands of cases, cases in which antihypertensive drugs could be discontinued have been recognized in 4.6%-6.1% every year in the last 4 years.

What kind of factors do they have who could discontinue antihypertensive drugs? In these cases, however, all related data are not available. Therefore, in this study, we investigated and examined cases that have all required data.

Subjects and Methods

There are thousands of patients with hypertension that we are managing and 4.6%-6.1% of them could discontinue antihypertensive medication. Among them, 50 subjects were included in this study, of which 25 were male and 25 females were associated with all necessary data.

In both groups of male and female, the mean age was 65.4 ± 8.6 years vs. 53.4 ± 6.2 years in groups of male and female, respectively, the mean BMI was 23.4 ± 2.7 vs. 22.3 ± 2.5, the median age of medication was 5. 5 years vs. 4.0, similarly (Table 1).

The method involves three management for subjects undergoing medical treatment at hypertensive outpatients. Those three are 1) the method of reducing dose for antihypertensive drugs, 2) adjustment of dietary habits by registered nutritionists, and 3) adjustment of exercise by nurses. Each detail is shown below

Method for reducing dose

Regarding the method of reducing dose for antihypertensive drugs, patients were instructed for diet adjustment and exercise therapy. When the patient's home blood pressure falls below the antihypertensive target of the Japan Hypertension Society, we instruct them to reduce the specified amount of antihypertensive agent in advance. They repeated this process and were instructed to lessen the dose of antihypertensive medicine. Even after discontinuing medication, they were instructed to stop visiting the clinic as long as the blood pressure was lower than the target level.

The blood pressure target adhered to the blood pressure value published in the hypertension guideline 2014 [5]. In this way, the transition of home blood pressure was observed while continuing living adjustment. When home blood pressure showed less than 120 mmHg

Variables	Male	Female	Total
subject (n) number	25	25	50
age (year)			
mean ± SD	65.4 ± 8.6	53.4 ± 6.2	59.4 ± 9.5
median (25%-75%)	66.6 (57.9 -71.4.3)	53.9 (51.0 -58.3)	58.1 (52.9-66.4)
BMI (kg/m²)			
mean ± SD	23.4 ± 2.7	22.3 ± 2.5	22.8 ± 2.6
median (25%-75%)	22.8 (21.7-25.4)	22.3 (20.7-23.9)	22.4 (21.4-24.3)
Medication (year)			
mean ± SD	6.5 ± 5.7	5.5 ± 4.3	6.0 ± 5.0
median (25%-75%)	5.5 (2.0-10.0)	4.0 (1.5-9.0)	5.1 (1.6-9.0)

Table 1: General status of the subjects.

in both morning and evening for 3 consecutive days, we instructed them to reduce the antihypertensive agent according to the designated method. We set less than 130 mmHg in the case of the subjects with late elderly.

We instructed them to observe the progress, when the blood pressure continued under the guideline target after discontinuation of antihypertensive agent. When the blood pressure rises and exceeds the blood pressure lowering target, they are instructed to start antihypertensive agent again. They are also instructed to call the clinic for consultation when they cannot judge or select the adequate way.

Adjustment of eating habits by a nutritionist

Adjustment of dietary life has been generally called "nutrition education". Because "education" has a mandatory atmosphere, our clinic has dealt with the idea of "meal consultation".

As we take 1 hour for the first time, and 30 minutes after the second time, we listen to the actual meal in detail and suggest improvement method. It is rare to improve by only one time, and usually to have efficacy on a continuous basis. Even if various measures are proposed from a registered nutritionist, patients may be difficult to accept. In such case, we repeat the method of suggesting other complementary methods.

Furthermore, when salt adjustment is performed, gradual decrease in home blood pressure can be realized for hypertensive patients. Consequently, they trust the recommended method more, and show active changes with further discussion with registered dietitian nutritionist.

Adjustment of exercise by nurses

Health exercise therapists and nurses teach exercise methods. The exercise content is decided according to each patient's orthopaedic problem, taste, and physical fitness and so on. We instructed them not to put a heavy load until they could control certain blood pressure. Aerobic exercise is fundamental, and they can choose walking, interval walking, slow jogging, pole walking, and others as they like.

When actually exercising, blood pressure measurements are recommended before, after, 30 minutes and 60 minutes after exercise. It is possible to realize the efficacy of the exercise by measuring the blood pressure before and after the exercise. In this way, there are many subjects who are motivated to succeed and continue active exercises themselves.

Results

The results of survey on the background, complications, and taking drugs for the subjects are shown in Table 2. There were remarkable differences of habits between males and females, in smoking for 76% vs. 0% and in alcohol intake for 60% vs. 0%, respectively. As to complications, data were 16% vs. 8% in type 2 diabetes, 32% vs. 52% in dyslipidemia, respectively. Similarly, in medication for antihypertensive agents, data were 64% vs. 36% for diuretics and 48% vs. 72% for ARB in males and females, respectively.

The results of guidance and intervention for the subjects on improvement of living including diet therapy and exercise therapy are shown in Table 3. Regarding the compared data of males and females, consultations on life improvement in median was 4.0 vs. equal to 4.0 times, weight loss in median was 2.2 kg vs. 1.6 kg, median period until the discontinuation of antihypertensive drug was 2.0 years vs. 2.5 years and the mean number of taking antihypertensive drugs was equivalent to 1.3 vs. 1.3.

For complication of the subjects, male vs. female showed 16% vs. 8% in type 2 diabetes, 32% vs. 52% in dyslipidemia. As to taking antihypertensive agents, there are 64% vs. 36% for diuretics and 48% vs. 72% for ARB, in males vs. females, respectively.

Discussion

Recently, 2017 High Blood Pressure Clinical Practice Guideline was presented as A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines [1]. It indicated 6 items of I-A level for recommendations for non-pharmacological Interventions, which are weight loss [15], a heart-healthy diet such as the DASH (Dietary Approaches to Stop Hypertension) diet [16], sodium reduction [17,18] potassium supplementation [19], increased physical activity and reduction in alcohol consumption [20-23].

Taking these 6 factors into consideration, we have continued to instruct the subjects. We especially instructed living adjustment focusing on diet, salt restriction, exercise, weight loss.

In our clinic, we have continued living adjustment guidance for years on team practice by doctors, registered nutritionists, health exercise therapists, nurses and so on. The main target is high blood pressure patients, and the goal is to adjust the lifestyle habit that includes all meals, exercise, psychological aspects.

Variables	Male	Female	Total
Background			
Family history for HTN	14 (56%)	19 (76%)	33 (66%)
Smoking	19 (76%)	0 (0%)	19 (38%)
Alcohol	15 (60%)	0 (0%)	15 (30%)
Complication			
Type 2 diabetes mellitus	4 (16%)	2 (8%)	6 (12%)
Hyperlipidemia	8 (32%)	13 (52%)	21 (42%)
Cerebral vascular accident	1 (4%)	0 (0%)	1 (2%)
Coronary heart disease	2 (8%)	0 (0%)	2 (4%)
Chronic kidney disease	0 (0%)	0 (0%)	0 (0%)
Medication			
Diuretics	16 (64%)	9 (36%)	25 (50%)
Calcium channel blocker	5 (20%)	6 (24%)	11 (22%)
ARB	12 (48%)	18 (72%)	30 (60%)

Table 2: History and complication of the subjects.

First of all, as a role of a doctor, the author published three books, circulated them broadly, and making full use of books in our clinic [12-14] (Figure 1). In the second book, we showed the adequate method concerning the dietary adjustment. For example, abstract teaching to take salt intake less than 6 g per day is not practical at all, because patient cannot be practiced. A practical and easy-to-understand explanation is necessary.

As a role of the team medical staff, 2 registered nutritionists adjust their diet, 6 health exercise therapists and nurses teach mainly exercise therapy to patients. When we observed the actual diet consultation on discussing with patients, common problems were found in general.

Several representative examples from our experience are described in the following.

i. The patient is on a reduced-salt diet, but the amount of salt intake per day is increasing, since the total intake amount per day is too much.

ii. Patients do not notice the fact that there is much salt hidden in the food, such as bread, cheese, noodles and so on.

iii. They believe that reducing seasonings would lead to salt intake reduction.

iv. They believe vaguely that Japanese style meal is good for health, which contains rather much salt.

Variables	Male	Female	Total
Nutritional consult (n)			
Mean ± SD	4.3 ± 3.3	6.7 ± 7.3	5.5 ± 5.7
Median (25%-75%)	4.0 (2.0-5.0)	4.0 (2.0-8.8)	4.0 (2.0-7.8)
Min / max	1 / 16	0 / 30	0 / 30
Weight reduction (kg)			
Mean ± SD	2.3 ± 2.7	2.2 ± 2.9	2.2 ± 2.8
Median (25%-75%)	2.2 (0-4.1)	1.6 (0-4.5)	1.8 (0-4.4)
D/C of med (year)			
Mean ± SD	2.9 ± 2.6	3.5 ± 2.9	3.2 ± 2.8
Median (25%-75%)	2.0 (1.3-4.0)	2.5 (1.5-4.5)	2.3 (1.3-4.0)
Kind of meds for HTN (n)			
Mean ± SD	1.3 ± 0.6	1.3 ± 0.5	1.3 ± 0.6
Median (25%-75%)	1.0 (1.0-1.0)	1.0 (1.0-2.0)	1.0 (1.0-2.0)
Min / max	1 / 3	1 / 2	1 / 3

Table 3: The effect of consultation for QOL.

Figure 1: Three books on management of hypertension by Masaaki Bando, MD. They were published in 2013, 2014, 2016.

v. When eating in a buffet style, patients are eventually taking a lot of salt including in many kinds of food.

Among them, ii) hidden salt has to be evaluated important, and 80% of the salt is said to be included as a hidden state in our usual meals [24]. For this reason, recognition and management of the food industry, government and the general public are required nutritionally, socially and economically as well. Reducing salt in the bread, processed meat, cheese, margarine and cereal manufacturing processes is calculated to lead to a prolonged lifespan year [24].

As mentioned above, it is only registered nutritionists that can analyze dietary habits of individuals, instruct them, and lead to reduced-salt diet. Since the subject cannot understand everything on just only once consultation, repeated consultation would be necessary. The median consultations in this survey were four times, and 50% of the subjects equivalent to 25%-75% consulted 2.0-7.8 times. In this way, we have established a system that allows us to continue intervention and advice by registered nutritionists. We would teach and intervene the patient's lifestyle with some positive effects.

Adequate changes in lifestyle are the cornerstone for the prevention and treatment for hypertension. Although rapid medical initiation is necessary for the patients in high level of risk, lifestyle changes are the fundamental for the therapy. According to the previous report, lowering effects for stable blood pressure can be equivalent to monotherapy of medicine. On contrast, the weak point would be the low level of compliance or adherence associated with necessary time for adequate action [25].

Adequate changes in lifestyle would be effective for some group of subjects [26]. For subjects with normal or subnormal hypertension, it can prevent or delay hypertension. For grade 1 hypertensive patients, it can prevent or delay medical therapy. Moreover, for hypertensive patients continuing on medical therapy, it can contribute to BP reduction of blood pressure and allow reduction of the number and doses of antihypertensive agents [26]. Appropriate changes in lifestyle would decrease other cardiovascular risk factors and improve several clinical conditions [27].

In order to reduce blood pressure, there are several recommended axes and directions for better lifestyle. They are as follows: 1) salt restriction, 2) moderation of alcohol consumption, 3) high consumption of vegetables and fruits and low-fat and other types of diet, 4) weight reduction and maintenance and 5) regular physical exercise [28]. In addition, cessation of smoking is necessary for decreasing cardiovascular risks. It has been reported that smoking has an acute pressor effect always raising ambulatory blood pressure [29,30].

For years, the discussion concerning salt intake and blood pressure has been continued. There have been some evidences for causal relationship between excessive salt intake and high blood pressure, and for contribution to resistant hypertension due to excessive salt consumption. Several mechanisms were found as to these relationships, such as increase in extracellular volume, elevate peripheral vascular resistance and stimulation of sympathetic nerve activation [31].

In many countries worldwide, salt intake amount in usually life is between 9 and 12 g per day. When the amount is reduced to about 5 g/day would lower systolic blood pressure about 1-2 mmHg in normotensive subjects, and 4-5 mmHg in hypertensive subjects or patients [28,32,33].

Consequently, reduced salt intake about 5-6 g/day would be recommended for general people. The reduced efficacy for salt would be found greater in several statuses, such as black race people, aged people, patients with metabolic syndrome, diabetes, chronic kidney disease. In this reason, reduced salt would decrease the number and doses of antihypertensive drugs [33]. The efficacy of decreased salt consumption for cardiovascular disease events remains unclear [34-36].

On contrast, the Trials of Hypertension Prevention (TOHP) trial with long-term follow-up showed that reduced salt intake was associated with lower risk of cardiovascular events [11]. There has been no evidence that reducing salt intake from moderate to high extent could cause any harmful influence [37].

As described above, salt reduction for hypertension is clinically necessary and effective. In this study, it seems that the case continuing salt reduction and living adjustment could discontinue the antihypertensive medicine. One reason for this would be that each tailor-made advice according to each patient seemed to be successful.

We instructed the target person to keep some exercise every day. Their contents include practice such as walking, fast interval walking, slow jogging etc. However, it is not enough to just recommend it, it is important to make the patient feel the effect for the future development.

For example, it is effective to measure the blood pressure before and after walking, 30 minutes, 60 minutes and to observe how it changes. Actually, blood pressure raises slightly immediately after exercise, but blood pressure surely decreases after 30 minutes and 60 minutes have elapsed. When the patient experiences, realizes and understands this blood pressure fluctuation, the patient will continue to actively exercise therapy afterwards.

There have been several reports concerning influence of exercise for blood pressure. As to previous epidemiological studies, regular physical aerobic exercise would have beneficial effects for prevention and treatment of hypertension, lowering cardiovascular risk and mortality. According to randomized controlled trials, aerobic endurance training decreases 3.0/2.4 mmHg in resting systolic and diastolic blood pressure. Even if the subject is hypertensive, systolic and diastolic blood pressure were reduced by 6.9/4.9 mmHg [38].

In cohort studies, regular physical activity showed about 20% mortality decrease, even if its level would be with lower intensity and duration [39]. Furthermore, similar efficacy has been found in the case of measured physical fitness [40]. As to recommended level, hypertensive patients would be advised to continue moderate-intensity dynamic aerobic exercise for at least 30 minutes on 5-7 days per week, such as walking, jogging, cycling or swimming [41]. In addition, aerobic interval training has been shown to decrease blood pressure [42].

There are other types of exercise, such as isometric resistance training and dynamic resistance exercise. The influence of both exercises for blood pressure was reviewed. The former exercise is not recommended at present, because of less available studies so far. In contrast, the latter exercise is recommended with following significant reduction of blood pressure. The latter also indicated the improvements of metabolic parameters, and it is advised to continue 2 or 3 times a week [43,44].

In this study, the weight loss was 2.2 kg on average for men and female, 2.2 kg vs. 1.6 kg at the median value, 4.1 kg vs. 4.5 kg at 75% quartile, respectively, with effect to some extent. Body weight is also involved in blood pressure, and blood pressure can be normalized if weight can be reduced. In our living adjustment project, we always explain this mechanism, actually check weight, fat and muscle mass with In Body apparatus, and motivate patients as well. If a case shows

remarkable lower limb muscle weakness, we indicate how to continue a safe squat [45].

Moreover, a systematic review of diabetic patients revealed that the mean weight loss after 1–5 years was only 1.7 kg [46]. It suggested that reduced weight could not be easily maintained. For pre-diabetic patients, combined interventions of dietary and physical activity showed extra 2.8 kg weight reduction after 1 year and further 2.6 kg reduction after 2 years [47].

There is a famous study which is the Action for Health in Diabetes (AHEAD) study for type 2 diabetes mellitus (T2DM). The results were that it did not decrease cardiovascular accident, and then the control for risk factors would be more necessary than weight loss itself.

As a matter of fact, reduction of weight would be promoted by anti-obesity drugs and/or bariatic surgery. These treatments may improve CV risk more in severely obese patients, which details are found in the ESH and the European Association for the Study of Obesity [48].

Hypertension has a close relation with increased body weight [49]. According to a meta-analysis research, reduction of weight was found after decrease of blood pressure Mean systolic and diastolic blood pressure were decreased 4.4 mmHg and 3.6 mmHg, with weight reduction of 5.1 kg in average [15]. In the case of obese hypertensive patients, weight reduction is necessary and recommended for control of risk factors. Furthermore, weight stabilization may be also set as a reasonable target in those cases.

As for patients with established CVD manifestations, they showed a worse prognosis even if after they had weight loss. The reason would be that they already have arteriosclerosis in many organs moderate to high degree. Maintenance of an adequate BMI and waist circumference would be necessary for non-hypertensive subjects in order to prevent hypertension and for hypertensive patients to reduce blood pressure. However, the optimal BMI has been unclear and in discussion, which was from two large meta-analyses of prospective observational population-based outcome studies.

According to the Prospective Studies Collaboration, the mortality was concluded to be lowest at a BMI of about 22.5-25 kg/m^2 [50]. However, recent meta-analysis results showed that the mortality was lowest in overweight subjects [51]. Consequently, reduction of weight can improve the effect of antihypertensive drug and cardiovascular risk factors. Reduction of weight would be performed not by monotherapy, but associated treatments including education for dietary nutrition and regular exercise.

Weight loss is a major recommendation and should be achieved with a balance of weight loss calories intake and physical activity increase [15]. As hypertensive patients have weight reduction, the blood pressure becomes lower as an effect. There is a clear dose response relationship of about 1 mmHg per kg weight loss.

For those who do not meet the goal of weight loss due to non-pharmacological intervention, drug therapy or minimally invasive and obese surgical procedures may be considered [9].

Our diet guidance sets salt reduction as the main direction. In addition, Dietary Approaches to Stop Hypertension (DASH) which is regarded as effective for hypertension, conventional calorie restriction (CR), recent low carbohydrate restriction (LCD), etc. are also presented as options and consulted according to each patient and decided [52,53].

Patients with hypertension have been formerly advised to take enough vegetables, dairy products, dietary and soluble fiber, whole grains and protein from plant sources, fatty food with less saturated material. Fresh fruits were also recommended so far, but obese patients should pay attention to weight gain because of high carbohydrate content in fruits [28,54].

Recently, the Mediterranean diet has been in focus. It seems to have protective effect for cardiovascular disease according to lots of papers of meta-analyses [55,56]. Hypertensive patients should be advised to have 300-400 g/day of fruit and vegetables and fish at least twice a week. For successful diet continuation, advice and management for diet adjustment would be performed with other lifestyle changes.

There was a comparative study, which includes DASH diet alone and DASH with exercise and weight loss. The latter resulted in greater reductions in blood pressure and left ventricular mass in hypertensive patients [57]. For the discussion between coffee intake and blood pressure, related studies of 10 RCTs and 5 cohort were found and showed insufficient quality to indicate the firm recommendation concerning the relationship between both factors [58].

As to alcohol intake, the prevalent ratio of daily habit was 76% for males and 0% for females.

There is linear relationship among 3 factors, which are alcohol consumption, blood pressure levels and the prevalence of hypertension. As hypertensive patients with medicine drink more, blood pressure rises [59]. Alcohol consumption from low to moderate extent would give no harm. However, drinking changes from moderate to excessive extent will cause elevated blood pressure, as well as increasing the risk for stroke.

The efficacy of alcohol reduction for blood pressure was investigated by The Prevention and Treatment of Hypertension Study (PATHS). There were 2 groups including intervention and control. The former group showed 1.2/0.7 mmHg greater reduction than the latter at 6-months period [60]. Concerning alcohol intake for ethanol per day, Hypertensive men with alcohol drinking are advised to limit no more than 20-30 g, and hypertensive female are advised to limit no more than 10-20 g. Alcohol intake per week is advised within 140 g for men and 80 g for women.

In this study, we investigated 50 patients who led to behavioral change by living adjustment and discontinued antihypertensive agents after lowering blood pressure. Medicated years (mean 25%-75%) before the intervention were 5.5 (2.0-10.0) years vs. 4.0 (1.5-9.0) years in male and female, respectively, ranging rather wide period.

As to complications, T2DM and hyperlipidemia were rather common, and cerebral vascular accident (CVA), coronary heart disease (CHD) and chronic kidney disease (CKD) were rare. This data suggest that these cases have less arteriosclerosis development. It may be the necessary factor to discontinue antihypertensive drugs. The average number of antihypertensive drugs is 1.3, and Angiotensin II Receptor Blocker (ARB) was frequently used in recent years.

According to the impression of the staffs with many clinical experiences, the patients have discontinued medicine successfully more as they consulted more times.

However, it is related to the limits of this research, and it is crucial to compare with the target group strictly, leading to our future task of the research. It can be interpreted that the number of years to medication (median (25%-75%)) was 2.3 (1.3-4.0) in 50 cases and that 75% of cases could be cancelled within 4 years. It took 2.3 (1.3-4.0) years (median

(25%-75%)) until the withdrawal the medicine overall, then 75% of cases can be interpreted to discontinue the antihypertensive agents within 4 years.

Conclusion

The misunderstanding has been spreading for both patients and medical professionals, in whom once you start the antihypertensive agents, you have to continue for a life time. This is not incorrect. When living adjustment is performed, blood pressure decreases due to behavior change. It is necessary to carefully observe the progress of the cases whether the antihypertensive drug will be unnecessary or will be restarted. The results in this study suggest that obtained data would become the fundamental research in the future, and the adjustment for diet and exercise would be useful for more adequate treatment for hypertension worldwide.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

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