Stress and Hypertension


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Abstract: Hypertension develops and progresses in people with hypertensive diathesis triggered by environmental factors such as stress and obesity. Granted that stress response in the cardiovascular system is induced by interactions between environmental stimuli and situational cognition of an individual, the development of hypertension depends on differences in situational cognition among individuals. This paper examines this issue by way of case study. A 53-year-old man with a 28-year history of labile and mild hypertension experienced abnormal elevation in blood pressure levels at ages 41 and 47 when he faced intractable problems. These abnormal blood pressure elevations did not respond to increase in antihypertensive drugs, but were able to be lower by changes in his life environment. However, severity of hypertension advanced following these two episodes. During his second hospitalization, physicians instructed the patient to confront problems with his wife that he had avoided, and he received treatment (autogenic training, fasting therapy, and group therapy) designed to help him become aware of his avoiding behavior. Although he has had white coat hypertension after the first abnormal BP elevation, his blood pressure has been stable for six years since discharge with no increase in dosage of antihypertensive drugs.

Key words: Hypertension; Autogenic training; Psychosomatic approach; Psychosocial stress

Introduction

There are three forms of stresses (or stressors to be precise), psychosocial stress, physical stress, and chemical stress. This paper focuses on the relationships between psychosocial stress and hypertension (essential hypertension).

Since we live in a competitive society filled with stresses, there is a heightened interest in the relationship between health and stresses. In reference to the results of a nationwide survey conducted in Japan in patients with hypertension, gastritis, or gastric ulcers, Nakai reported that 78% of hypertensive patients were aware of the relationship between their disease and stresses.1) This information indicated that most of hypertensive patients believe the disease to be associated with stresses.

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The Framingham study, for example, demonstrated that, during 18–20 years of observation, middle-aged men with high levels of tension or anxiety were 2.19 times greater susceptible to hypertension than those without such stress factors. According to Pickering, the extent of an increase in the blood pressure level is greater among men with a high workload and no discretionary powers.

These days, hypertension is considered a multifactorial genetic disease that is triggered by interactions between environmental and genetic factors. In other words, hypertension is believed to develop as a result of a combination of predisposition to hypertension and environmental factors such as stresses, dietary habits, obesity, hyperlipidemia, smoking and alcohol consumption. It is easier to be understood that stress responses in the cardiovascular system result from interactions between environmental stimuli and individual situational cognition, as stated by Steptoe.

This paper examines the relationship between stresses and hypertension by way of case study. It suggests that the lack of individual situational cognition greatly contributes to the onset and progress of hypertension.

**Case Report**

The patient (“Patient A”) is a currently 53-year-old man and a high school teacher. His family history reveals that he has predisposition to hypertension, as his father had hypertension and died of acute myocardial infarction (at the age of 72), his grandfather also had hypertension and died of stroke, and his brother is also a hypertensive and is receiving treatment.

With reference to psychosocial backgrounds of the patient, he developed an inferiority complex about his skinny body when he was in a primary school and has ever since felt nervous when meeting people because he feels as if his skinny body was always stared at. In high school, wearing shorts for physical education lessons became an intolerable experience for him. Since his school was an academic high school having many excellent students, school work as well as body image became a source of another inferiority complex. He then began to feel a strong physical stress whenever he faced situations that he had never experienced before. Eventually, he stopped attending physical education lessons when he did not feel well.

The onset of the present illness dates back to his high school days. When Patient A was a junior in high school, he visited the department of internal medicine at our hospital, complaining of unwell feeling and malaise. Although a high blood pressure (150/80 mmHg) was pointed out, he kept it untreated. When he became a high school teacher at the age of 25, hypertension (170/90 mmHg) was pointed out at every annual health check-up, but it remained untreated. At around the age 34, he was under a lot of stresses at work and experiencing anxiety and dizziness. His home doctor referred him to the department of internal medicine at our hospital for psychosomatic approaches. He was given a diagnosis of borderline hypertension and anxiety neurosis, and received autogenic training in addition to an antianxiety drug and a beta-blocker for tachycardia.

The subsequent clinical course had been favorable until Patient A, at ages 41 and 47, confronted intractable stresses, which led to abnormally high levels of blood pressure. Changing living environment (e.g. hospitalization) improved his hypertension in both incidences, and during the second hospitalization, he for the first time had an opportunity to learn stress coping skills to face his unsolved problems squarely. Since then, he has been able to lead a full life to date.

**Psychophysical Responses, Continuous Elevation in Blood Pressure in Particular, under Intractable Stresses**

1. More than 25 years had passed since hypertension was pointed out in Patient A. Until recently, he was living in fear of hyper-
tension and a cerebral stroke. In July of 1990, when he was 41, he distressed himself with intractable marital problems on top of stresses at work. Before this incident, his blood pressure had been around 130/85 mmHg, but it rose to 150–160/90–110 mmHg and he began to experience general malaise, easy fatigability, and stiff neck. Since the blood pressure did not fall despite an increase in the daily dosage of nifedipine from 20 mg to 40 mg, he was admitted to our department in October 1990. On admission, although the level of noradrenaline in the urine was high at 209 μg/day, no other evidences indicative of secondary hypertension were observed.

The blood pressure began to fall on the third day of admission due partly to the fact that he was able to feel relaxed, and he was discharged on the 20th day. He returned to work after some rest, and he began to exhibit the blood pressure levels over 160/90 mmHg in periodical outpatient check-ups. In addition to tranquilizers and beta-blockers, 10 mg of nitrendipine was administered and treatment response was favorable. However, at around this time he started to present signs of white coat hypertension with the blood pressure of 200/110 mmHg in periodical check-ups.

2. The condition of Patient A had been under control for five years following the discharge. However, he led a stirring life for half a year in 1994, marital problems surfaced again, and he developed feelings of exhaustion and malaise, which interfered with his job performance. When he visited a local hospital in May 1995, his blood pressure was abnormally higher at 230/130 mmHg than the levels from five years earlier. He was immediately admitted to a hospital specialized in cardiology (“Hospital A”), where he underwent a detailed examination for secondary hypertension, but the result turned out to be negative.

Although the blood pressure dropped as a result of increased dosage of antihypertensive drugs, the level of 230/130 mmHg was continuously observed after he returned to work, and he was once again admitted to Hospital A in July 1995. Since headaches and tinnitus persisted, he was transferred to our hospital in August 1995. Drugs prescribed on August 31 were as follows: one 10 mg tablet of nitrendipine, one tablet of beta blocker, tranquilizer, and sleeping pills. The average blood pressure based on ambulatory blood pressure monitoring (ABPM; 24-hour measurement of the blood pressure) was 152/94 mmHg.

Psychosomatic Approach and His Clinical Course

Patient A is by nature a serious and hypersensitive person. High blood pressure was pointed out when he was 16, and it further worsened the inferiority complex that he had had about his body. Ever since he stopped attending physical education lessons using his high blood pressure as an excuse, he had begun to avoid situations that arouse anxiety.

On the first hospitalization, he was discharged without realizing the relationship between stressors and high blood pressure. Although guidance should have been given at that time, it was difficult to intervene in marital disputes, resulting in postponement of essential problems. However, the disease progressed when the high blood pressure persisted for three months, and there was no other choice but to initiate treatment with antihypertensive drugs after he was discharged from the hospital.

Despite the fact that his second admission resulted from stress at work and marital problems just like the first admission, Patient A was not fully aware of it. Unlike the first admission, his blood pressure was abnormally high and he found himself seized with the fear of a cerebral stroke. After he was admitted to our hospital, the blood pressure began to fall in a few days after appropriate treatment with tranquilizers, etc. As a preventive measure, counseling was subsequently initiated in an attempt to help him understand the relationship between stress and elevation in blood pressure. The emphasis
of the counseling was not on how to evade stressful situations using high blood pressure as an excuse, but on how to recognize and deal with the stressors.

Treatment included autogenic training to facilitate relaxation of mind and body, and participation in group therapy twice weekly. In addition, fasting therapy was also proposed to provide him with an opportunity to experience how to overcome stressful situations by himself. He accepted the proposal, started 10-day fasting therapy starting on the 33rd day of admission, and completed it despite sufferings.

ABPM was performed on August 31, which was the day for group therapy, and the blood pressure levels in the resting state at 16:00 and 16:30 were 144/95 and 149/91 mmHg, respectively, and they were 193/114 and 190/113 at 17:30 and 18:00, respectively, during group therapy. These data positively influenced the way for him to perceive blood pressure. The following remarks were made by him prior to his discharge from the hospital.

“Listening to speeches and thoughts of others in group therapy, I came to realize that I fell short of confronting with my own problems and I was too dependent on people around me.”

“It came to my mind when I was awakening in the morning that ever since I was found to have hypertension 30 years ago, I have always run away from dealing with every stressful situations, such as agonizing, troublesome, unfavorable, or scabrous situations, on the excuse of hypertension. To make things worse, I developed fear of death from a cerebral stroke whenever my blood pressure went up, and I pictured this scenario in my mind again and again. I have now realized that my body came to respond such a way over these long years.”

Although the outcome of fasting therapy fell short of our expectations, the second hospitalization, unlike the first one, gave him opportunities to reflect on his inner self, talk about the relationship with his wife, and think deeply about his family. He returned to work two months after discharge. Six years have passed since then, and he is now able to put his blood pressure under control even when facing stressful situations, and is leading a fullhearted life, although he still has white coat hypertension and hypertension. For six years, there has been no dosage increase in medication, or 50 mg of atenolol and 20 mg of nifedipine per day, and no changes have been observed in the ocular fundi or the heart.

**Conclusion**

Those who are living in modern society are frequently exposed to unexpected stress. The ability to control and manage stress is a determining factor in the development and progression of hypertension. It should be noted that blood pressure response to an abnormally high and uncontrollable level of stresses can be life-threatening and can even exhibit resistance to drug therapy.

Ignorance or false knowledge often leads people to taking inappropriate reactions to stressors. The key for treatment of hypertension lies in physicians’ instructions and social support systems (which allows a temporal retreat from the stressful situations) for patients to correctly change or modify inappropriate coping behaviors.

**REFERENCES**


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