Ischemic Heart Disease

Takenori KIKUCHI
Advisor, The Sakakibara Heart Institute

Abstract: The cardiovascular system is particularly susceptible to influence of emotional stresses, and it has long been thought that the location of emotions was in the heart. In recent years, it became known that stresses promote abnormalities in circulation kinetics and aggravate arteriosclerosis via the nerve and endocrine systems. Autonomic nerves, in particular, mediate the onset of coronary vasospasm, a disease prevalent in Japan. Stresses are known to directly trigger attacks of angina pectoris and myocardial infarction, particularly emotions of anger (or hostility) increasing the risk. Depression is also reported to be involved with the onset of this disease. One of the risk factors for ischemic heart diseases noted recently is Type A behavior pattern—so-called workaholic type personality—, and the emphasis in recent years is on anger and quick temper as their causes. The result of our studies on Japanese revealed the same tendency as that of westerners of pronounced psychological traits of anger and quick temper, particularly in patients aged 50 or younger.

Key words: Anger and anxiety; Coronary vasospasm; Type A behavior pattern; Japan Mental Health Inventory (JMI)

Introduction

It is known since old times that angina pectoris and myocardial infarction are triggered by emotional stresses as described by Heberden (1768) who first recorded angina pectoris accurately. There is a report that many people in Japan suffered attacks of angina pectoris while watching sports programs on TV such as those of professional wrestling.

Meanwhile, the personality or behavior pattern peculiar to patients of ischemic heart disease is known as a risk factor. In this case, what may be described as chronic stresses must be involved.

The cardiovascular system is particularly susceptible to influence of emotional stresses, as it has long been described that emotions are located in the heart. Emotional heart (mind) and organic heart are thus regarded as identical. Cannon et al. (1915) found that changes in the cardiovascular system occur by stresses via the nerve and the endocrine systems, and cause psychosomatic disorders such as ischemic heart...
diseases, hypertension, arrhythmia, etc.

Stresses and Changes in Cardiovascular System

As mentioned above, Cannon reported that when the biological body encounters an emergency, it manifests a series of reactions called “emergency reactions” in the sympathetic nerve-adrenaline gland system and demonstrated by animal experiments that the heart rate increases, the small arteries contract and blood pressure becomes elevated. However, anxiety and anger are said to affect the cardiovascular system in slightly different ways even though both are emotional stresses.

Carruthers et al. hypothesized the relation between catecholamines and heart diseases as shown in Fig. 1 (1981). According to them, noradrenaline is mainly related to aggressive emotions (anger) and mobilizes lipid (free fatty acid) more intensely. If this lipid increase in blood is not metabolized by physical exercises, it is synthesized into neutral fats and cholesterol, causing arteriosclerosis and inducing myocardial ischemia. On the other hand, adrenalineline is related to intense anxiety, and directly causes arrhythmia, angina pectoris, myocardial infarction, etc. along with noradrenaline.

More recently, Henry et al. (1990) reported a route of stimulating hypothalamus—hypophysis—adrenal cortex system by depressive reaction in addition to activating the route of amygdala—sympathetic nerves—adrenal medulla by the fight-flight reaction to stresses.

Erbel et al. (1981) presented a schematic drawing regarding coronary vasospasm, a disease said to be widely prevailing in Japan, as shown in Fig. 2. Alpha-receptors of the sympathetic nerves are assumed to be mainly related to coronary vasospasms, but involvement of parasympathetic nerves is also suspected. Other factors as causes for vasospasms include localized vascular factors (thromboxane, etc.) and alkalosis of blood. Hyperventilation syndrome due to anxiety and strain is suggested to induce coronary spasms by generating alkalosis.

Stress and Ischemic Heart Diseases

1. Stress and heart attacks

Ishikawa et al. reported that occupational
stressful interviews induced attacks of angina pectoris. According to Shinoda,3) 36 (15%) out of 240 angina pectoris attacks were deemed to have been induced only by psychological factors, and 117 (48.8%) were attributed to combination of psychological and physical factors. Further examination revealed that many attacks occurred while the patients were watching sports programs on TV. Strain, anxiety, frustration, and anger were also cited as psychological factors.

The onset of myocardial infarction in 16 out of 43 patients was described by Weiss 4) as related to acute emotional stresses. He recognized chronic stresses in 21 others. In the latter case, patients were not clearly aware of the stressor and therefore information (such as recent increase in alcohol intake or insomnia) provided by spouses or family members is important.

As hypothesized by Carruthers et al., the relation between ischemic heart diseases and emotional stresses, particularly anger (or hostility), is attracting attention in recent years.

Mittleman et al. (1995)5) reported that the risk for attack increased by anger within two hours preceding the onset (relative risk, 2.3). A report from Sweden (1999) also described that the risk of attack of myocardial infarction was high within one hour of violent anger.

On the other hand, it is reported that depression is very much related to the onset of the present disease and also that the depressed state worsens prognosis.

Appels et al. (2000)7) divided the subjects with severe angina pectoris who had undergone coronary artery plasty into those with depressed mood and those without, measured cytokines and virus antibodies, and reported that the former group showed respectively higher values. This indicates that inflammatory diseases and depressed mood may be involved with the onset.

2. Personality traits and ischemic heart diseases

A risk factor for ischemic heart diseases which is reported in recent years is specific personality traits or Type A behavioral pattern. Friedman et al. (1959) named the behavioral pattern that is susceptible to ischemic heart diseases as “Type A” based on their clinical experience, and the pattern subsequently became known widely. Type A pattern means the personality who sustained and passionately drives
the self for achievement, is competitive with his/her peers both at work and in avocation and is driven by time. Their follow-up study for 8.5 years from 1960 revealed that the incidence of ischemic heart diseases was higher by two times in Type A personality than in Type B (contrastingly gentle and mild personality).

Recently, Friedman emphasized “impatience” and “free-floating hostility” as expressive factors of Type A behaviors and pointed out that it was a medical disorder. Many other subsequent studies reported that personality traits of hostility or anger were particularly related to the present disease.

“Anger” may be expressed as “anger-out” and “anger-in”, and suppressed anger such as “anger in a different form as cynical or slander” is also considered problematic.

The author and his colleagues conducted a study (1994) on ischemic heart diseases among working men using Japan Mental Health Inventory (JMI) developed for mental health surveys of industrialists by Japan Productivity Center (currently Social Economic Productivity Center). The result is discussed below.

Compared to controls, ischemic heart disease patients have many complaints about other parts of their body beside the cardiovascular system, have strong sense of fatigue, are quick tempered and easily angered, but at the same time they are concerned about others, and have neurotic emotions such as anxiety, etc. Compared to the controls of the same age group, they were more active, less tenacious but had the superior complex.

As for their personality traits, they were highly flexible, spontaneous, and future-oriented, but had less control over emotions. In other words, they were highly sociable and positive, motivated, had a tendency to do things in haste, and were emotional. These personality traits seem to coincide with those of Type A behavioral pattern as described by Friedman et al. In their workplace, their relationship with co-workers was not good and they did not have the sense of belonging.

Subsequent studies conducted by us revealed that 72% of comparatively young ischemic heart disease patients whose onset occurred at an age below 50 had higher scores for anger and quick temper.

Psychological and social factors influencing the onset of ischemic heart diseases are also reported. A study on Japanese-Americans in California revealed a higher incidence of this disease in those who grew up in completely westernized surroundings than those who grew up in surroundings retaining more Japanese traits as disciplines. There were no differences in the contents of meals, and the author assumed that this was due to the difference in social support by families.

Conclusion

Stress not only induces the attack of ischemic heart diseases directly, but also aggravates on chronic basis arteriosclerosis through daily habits. The important thing is to understand their personality traits, particularly psychology of anger and quick temper, and to offer optimum countermeasures for emotional stresses as primary and secondary preventions. Psychosomatic approaches are always recommendable for ischemic heart diseases.

REFERENCES

5) Mittleman, A.M., Maclure, M., Sherwood, J.B., et al.: Triggering of acute myocardial infarction...


