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The Associations of Coping Mechanism with Arterial Stiffness in Hwa-Byung Patients

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Objective The goal of this study is to assess the relationship between stress coping mechanisms and the risk of atherosclerosis in patients with Hwa-Byung.

Methods The Korean version of the Ways of Coping Checklist (WOCC) was administered to 50 patients with Hwa-Byung (49.1±10.1 years, 6 males). Brachial-ankle pulse wave velocity (baPWV) and serum cholesterol level were assessed in all participants.

Results After controlling for age, sex, diagnosis of hypertension, Body Mass Index (BMI), and serum cholesterol level, the score of seeking social support in coping strategies was negatively correlated with right and left baPWV (r=-0.356, p=0.016; r=-0.373, p=0.012, respectively). In addition, the score of active coping mechanism was negatively correlated with both sides of baPWV (r=-0.383, p=0.009; r=-0.389, p=0.008, respectively).

Conclusion The seeking social support and active coping mechanism were inversely related to the severity of arterial stiffness in Hwa-Byung patients. Therefore, our result may suggest a possibility that coping strategies in Hwa-Byung patients are associated with the risk of atherosclerosis. **Psychiatry Invest 2009;6:241-244**

Key Words Hwa-Byung, Coping mechanism, Atherosclerosis.

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Introduction

Psychological stress is an inevitable element of daily living. The role of psychological stress on health issues depends on subjective appraisals, types of coping strategies or availability of social supports in individuals.[1,2] Mental stress is known to be associated with cardiovascular diseases including atherosclerosis and coronary artery disease in prior studies.[3-5] It has also a prolonged unfavourable effect on arterial stiffness and wave reflections via regulators such as catecholamine and endothelial function.[6-8] Increased arterial stiffness is one of the pathological states of vascular diseases, and is closely associated with atherosclerotic cardiovascular disease. In prior study, the associations between job stress and arterial stiffness were shown as well.[9] Therefore, how to deal with stress, so called coping mechanism, could play an important role in the risk of atherosclerosis.[10] In addition, individuals with maladaptive coping strategies were suggested to be more vulnerable to psychiatric difficulties including depression and anxiety, which could be cardiovascular risk factors.[11]

Pulse wave velocity (PWV) is known to be a useful and non-invasive indicator of arterial stiffness,[12] and the measurement of brachial-ankle PWV (baPWV) has recently been applied as a reliable marker for atherosclerosis in general population.[13] The time delay between the rapid upstroke of pulse waves between the brachial artery and the ankle artery simultaneously is recorded. PWV was defined as the ratio between the distance and the time delay.[14]

Hwa-Byung is a well-known Korean culture bound syndrome with high preval-

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ence among middle-aged married women of lower socioeconomic status and lower educational background.[15,16] Patients with Hwa-Byung have various psychological and somatic symptoms including depressed mood, anxiety, pushing-up in the chest, chest tightness, and so on.[15,16] In terms of the relationship between Hwa-Byung and cardiovascular disease, their somatic complaints often could be confused with the symptoms of cardiovascular disease. In addition, characteristics of Hwa-Byung such as the age of prevalence, low socioeconomic status and psychiatric symptoms could be related to various risk factors of cardiovascular disease.[17]

Prior studies reported that Hwa-Byung patients frequently used ineffective coping strategies such as active forgetting, accommodation, fatalism, emotional pacification and emotional support seeking.[18] In addition, they frequently employed passive withdrawal, self-criticism, perseverance, seeking of social support and religious guidance in stressful situations.[16]

In this study, we hypothesized that characteristics of stress coping mechanisms would be related to arterial stiffness in Hwa-Byung patients. We aimed at investigating the association of coping strategies with the risk of atherosclerosis assessed by baPWV in individuals with Hwa-Byung.

Methods

Initially, fifty-five patients who visited Hwa-Byung clinic participated in current study. Hwa-Byung was diagnosed based on the participants' responses to two questions.[19] 1) Do you think you have Hwa-Byung? 2) Do others think you have Hwa-Byung? Finally, 50 patients (49.1±10.1 years, 6 males) who answered "yes" to both questions were enrolled. Gathering of demographic information, medical history and the Korean version of the Ways of Coping Checklist (WOCC)[20] were administered to final subjects. None had history of serious medical disease.

WOCC was developed by Folkman and Lazarus[21] to assess how to deal with stress. The Korean version of this scale was validated by Kim and Lee.[20] It consists of 62 items measuring each stress coping strategy of problem-focused (analyse the problem or plan to act), seeking social support (talk to someone and get support and advice), emotional-focused (attempts to regulate emotional states that result from the stressful situation) and wishful thinking (wish or hope). In this checklist, coping mechanisms of problem-focused and seeking social support are classified into the active coping, and emotional-focused and wishful thinking into the passive coping.[20,21]

On the day for measuring baPWV and serum cholesterol level, all subjects were instructed to refrain from breakfast, coffee, and smoking on the morning of check-up. BaPWV were measured using automatic waveform analyzer (VP-1000 type 230, Japan). Measurements were taken with subjects lying in a supine position after resting at least 5 min. PWV (in centimetres per second) was calculated as the ratio between distance traveled by the pulse wave and the time delay. The average of at least 10 successive measurements was used in the analysis. An increase of baPWV indicates increased arterial stiffening.

After controlling for age, sex, diagnosis of hypertension, Body Mass Index (BMI), and serum cholesterol level which are known as risk factors of atherosclerosis,[22] partial correlation analysis between the score of each strategy in the coping checklist and baPWV was performed by Statistical Package for Social Science (SPSS; SPSS Inc, Chicago, IL, USA) 11.5 program. The statistical significance level in current study was set at $p<0.05$.

Results

Table 1 showed the mean scores of WOCC subscales and of baPWV, as well as the demographic characteristics of subjects. After controlling for age, sex, diagnosis of hypertension, BMI, and serum cholesterol level, the score of seeking social support in WOCC was negatively correlated with right and left baPWV (r=-0.356, p=0.016; r=-0.373, p=0.012, respectively). In addition, the score of active coping mechanism, i.e., the sum score

TABLE 1. Demographic characteristics, scores of WOCC and baPWV (N=50)

	Mean±SD
Age (years)	49.1±10.1
Sex	
Female	44 (88.0%)
Male	6 (12.0%)
Active coping	
Problem-focused	29.48±9.90
Seeking social support	16.42±7.21
Total	46.14±10.55
Passive coping	
Emotion-focused	29.56±9.75
Wishful thinking	23.44±7.13
Total	52.22±11.69
BaPWV (cm/sec)	
Right	1368.20±231.31
Left	1373.58±225.86
Body Mass Index	23.21±2.53
Dx of hypertension	12 (24%)
Serum cholesterol (mg%)	190.60±38.01

WOCC: the Ways of Coping Checklist, baPWV: brachial-ankle pulse wave velocity

TABLE 2. Partial correlations between score of WOCC and baPWV (N=50)

	BaPWV (right)	BaPWV (left)
Active coping	-0.38**	-0.39**
Problem-focused	-0.14	-0.14
Seeking social support	-0.36*	-0.37*
Passive coping	0.14	0.17
Emotion-focused	0.15	0.16
Wishful thinking	0.02	0.03

All values calculated after controlling for age, sex, diagnosis of hypertension, Body Mass Index, and serum cholesterol level. *p<0.05, **p<0.01. WOCC: the Ways of Coping Checklist, baPWV: brachial-ankle pulse wave velocity

of problem-focused coping and seeking social support, was negatively correlated with both sides of baPWV (r= -0.383, p=0.009; r=-0.389, p=0.008, respectively). Scores of other subscales in WOCC had no significant correlation with baPWV (Table 2).

Discussion

In this study, we found the inverse relationship of the seeking social support to arterial stiffness assessed by baPWV in Hwa-Byung patients. In addition, active coping strategies including problem-focused and seeking social support were negatively correlated with baPWV.

The core concept of Hwa-Byung is thought to be originated from the emotion of "Hahn" which is defined as mixed feelings of sorrow and anger in Korean culture.[23] It is known to be caused by long-standing psychosocial stress of familial discords, economic difficulties, troubles with mother-in-law or sister-in-laws and unfair treatments by in-laws.[24] And, managing suppressed or repressed anger is the most important dynamic mechanism in the concept of Hwa-Byung.[23] Therefore, the pathogenesis of Hwa-Byung could be related to maladaptive coping to chronic stress. Hwa-Byung patients have been suggested to deal with their stress by more passive or emotional coping mechanisms.[16,18]

Regarding psychiatric symptoms in Hwa-Byung, prior studies suggested that symptoms of Hwa-Byung may be closely related to those in somatization disorder, generalized anxiety disorder, depression or panic disorder among diagnostic categories of the western medicine.[25]

Maladaptive coping mechanisms could worsen psychiatric symptoms of depression, somatization and anxiety.[11] Therefore, adaptive and/or maladaptive coping mechanism might be meaningful in physical and mental health of individuals with Hwa-Byung.

Depressed mood, anxiety and psychosocial stress have been known to be aggravating factors of mortality in cardiovascular diseases.[26,27] Yeragani et al.[28] noted increased PWV in patients were associated with anxiety. Furthermore, carotid-femoral PWV was suggested to have association with depression.[14]

In this study, less use of seeking social support coping was related to increased risk for atherosclerosis in Hwa-Byung patients. This result is supported by previous notion of which social deprivation is one of predictors on atherosclerotic progression in general population.[29] Another plausible explanation might be that more severe depression and/or anxiety as risk factors of atherosclerosis in Hwa-Byung could also play negative roles on their social relationships from which they can get support. In addition, we found that the active coping mechanism was inversely associated with the arterial stiffness of Hwa-Byung patients. This association could be mainly caused by its relationship with the coping strategy of seeking social support. However, the significance level in the association with active coping mechanism was higher than that in relation to only the seeking social support. There was a tendency of negative correlation of problem focused solving with the severity of arterial stiffness, although it was not statistically significant. Problem focused solving involves strategies that reduce stress by determining the best solution and means to achieve. When individuals believe that nothing can be done to deal with the stress, they employ emotional coping mechanisms including wishful thinking or avoidance.[30] Problem focuses process might be performed under healthier ego function and/or less stressful event.[30] Ineffective coping with less active strategies in Hwa-Byung patients was related to increased risk of atherosclerosis in this study.

No significant relationship between passive coping strategies and baPWV was found in current study. Prior notion, which individuals with higher diastolic blood pressure employed more frequently passive coping strategies of wishful thinking, avoidance, and minimization of threat, was inconsistent with current result.[31] This discrepancy may be caused by different characteristics of study subjects of general employees from current study. Coping strategies in Hwa-Byung patients might be quite different and more maladaptive from those of general population.[16,18] Further research with larger sample size will elucidate this issue more clearly.

There were several limitations in current study. Small sample size, no comparison group, no information of smoking status, and no objective assessment of psychiatric symptoms might limit generalizations of current results.

However, to the best of our knowledge, this is the first study which investigated the association of coping style with the risk of atherosclerosis in individuals with Hwa-Byung. Moreover, it can be one of strengths of our study

to control statistically well-known contributing factors of atherosclerosis such as age, sex, diagnosis of hypertension, BMI, and serum cholesterol level.

In summary, we reported that coping styles to stress was related to arterial stiffness in Hwa-Byung patients. Therefore, our result may suggest a possibility that education and strengthening adaptive coping strategies in Hwa-Byung patients reduce the risk of atherosclerosis.

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