

## Type A Behavior and Anger in Stroke Patients

Chon, Kyum Koo

Chon, Joong Son

An, Shin Ho

Rehabilitation Psychology  
Taegu University

Rehabilitation Medicine  
Pochon CHA University

Rehabilitation Medicine  
Yeungnam University

Chang, Sung Ho

Kwak, Eun Hee

Spielberger, C. D.

Rehabilitation Medicine  
Yeungnam University

Rehabilitation Medicine  
Yonsei University

Psychology  
University of South Florida

This study investigated the Type A Behavior (TAB) and anger in cardiovascular patients who had suffered a stroke. The participants were 42 stroke patients who were compared with 36 low back pain patients. TAB and the experience, expression, and control of anger were assessed by the Korean adaptation/translation of the Eysenck and Fulker (1983) TAB scale and Spielberger's (1988) State-Trait Anger Expression Inventory. Stroke patients had significantly higher scores than low back pain patients on the TAB Tenseness subscale and the STAXI Trait Anger Scale. However, logistic regression analysis revealed that trait anger, but not TAB, was an important predictor of stroke. When stroke patients were divided into cerebral infarction vs. hemorrhage groups, the cerebral infarction group had higher STAXI Trait anger, Anger-In, Anger-Out, Anger-Control, and higher TAB Tenseness and Ambition scores than the hemorrhage group. These findings suggested that anger but not TAB was an important psychological factor that contributed to stroke. Differences in TAB tenseness and ambition and the experience and expression of anger were also important determinants of the particular type of stroke that was experienced.

Stroke, a subtype of cardiovascular disease, is one of the critical diseases in modern times. Recent studies have attested that anger is an important psychological factor in cardiovascular disease (Siegman, Townsend, Blumenthal, Sorkin, & Civelek, 1998; Spielberger, Reheiser, & Sydeman, 1995), including stroke (Everson, Kaplan, Goldberg, Lakka, Sivenius, & Salonen, 1999).

The recent resurgence of interest in anger is in part an outgrowth of studies of Type A Behavior (TAB, Friedman & Rosenman, 1974). Originally, it was thought that the global concept of TAB was predictive of coronary heart disease (CHD), another major subtype of cardiovascular diseases. Subsequent studies showed, however, that the critical factor to CHD was not TAB itself, but

sub-components of TAB such as anger or hostility (Friedman & Booth-Kewley, 1987; Dembroski & MacDougall, 1985). The literature review suggests that, although there have been exceptional studies (e.g., Leon, Finn, Murray, & Bailey, 1988), anger and/or hostility have been associated with hypertension (Everson, Goldberg, Kaplan, Julkunen, & Salonen, 1998; Spicer & Chamberlain, 1996; Spielberger, Johnson, Russell, Crane, Jacobs, & Worden, 1985), coronary heart disease (Kawachi, Sparrow, Spiro, Vokonas, Weiss, 1996; Mittleman, Maclure, Sherwood, Mulry, Tofler, Jacobs, Friedman, Benson, & Muller, 1995), and stroke (Everson, et al., 1999; Sacco, Benjamin, Broderick, Dyken, Easton, Feinberg, Goldstein, Gorelick, Howard, Kittner, Manolio, Whisnant, & Wolf, 1997).

As described above, both Type A behavior and anger/hostility have been proposed as important psychological factors relevant to cardiovascular disease. In contrast to CHD or hypertension, however, the relations between Type A behavior/anger and stroke have seldomly been explored, especially in developing countries, including Korea.

Recently, Kim, Yoon, Lee, Yoo, Kim, Choi-Kwon, and Lee (1998) examined the relations between Type A behavior and stroke with a Korean sample. More specifically, when they compared 224 stroke patients with 100 controls, a subtype of Type A Behavior, 'Tenseness,' was shown to be an important psychological factor in strokes. Tenseness was also shown to be significantly higher in the cerebral infarction group than in hemorrhage group.

Despite the significance of their pioneering work regarding the role of psychological factors in strokes, at least with the Korean sample, there were several shortcomings in the study by Kim et

al.. First, as described above, although Type A Behavior is still considered a viable factor in cardiovascular disease (Bages, Warwick-Evans, & Flager, 1997), the majority of recent studies have been focused on anger/hostility instead of TAB itself. Second, and more importantly, since Kim et al did not provide any information on the reliability and validity of the scale employed in their study, it is hard to meaningfully interpret their findings. Third, the control group was heterogeneous, comprising 43 relatives of the stroke patients, 7 caregivers of the stroke patients, and 50 patients other than stroke patients.

The present study explored the relations between psychological factors and stroke with more refined concepts and measurements. More specifically, (1) anger as well as Type A Behavior was included in the study. (2) The reliability and validity of the scales was examined, and then only reliable and valid ones were included in the analyses. Finally, (3) the control group was more homogeneous people.

Among the above mentioned three strategies adopted in the present study, (1) and (2) appear self-evident. However, the rationale behind the inclusion of the more homogeneous low back pain patients as a control group needs to be elaborated upon. The main reason low back pain patients were utilized as a control group was to control the level of stress. Stated differently, since both stroke patients and low back pain patients were inpatients at the same unit of the hospitals, the findings would provide a more meaningful interpretation, controlling possible contaminating effects of the stressful experience of being a patient. Additionally, the findings would provide clear-cut group differences, at least between stroke patients and low back pain patients.

## METHOD

### Participants and procedure

Participants were 45 patients admitted consecutively for stroke treatment at two large university hospitals in Seoul and Taegu. The exclusion criteria were: (1) lower than 23 in MMSE; (2) stroke due to Moya Moya, vasculitis, or anticoagulant overuse; (3) communication problems due to dementia; (4) a previous history of depression or other psychiatric disorders; (5) without CT or MRI; and/or (6) reluctant to be studied. Three stroke patients did not complete the questionnaire by more than 10 items, and thus were eliminated from the total sample, leaving 42 for further analyses. Controls were 36 low back pain inpatients at the same unit of a university hospital in Taegu during the same period of time as that of the stroke patients. The exclusion criteria for the control group were (3), (4), and (6) among the six criteria mentioned above. In short, both cases and controls were inpatients at large university hospitals who completed a set of questionnaires, which included items concerning Type A Behavior and anger.

### Measures

**Type A Behavior:** In the present study, we employed the same questionnaire used by Kim et al. (1998). The original scale was developed by Eysenck and Fulker (1983). Both Kim et al. (1998) and Yoo (1990) employed the Korean adaptation/translation of Eysenck and Fulker's scale (1983) in their studies. Unfortunately, however, they did not provide any detailed information about its internal consistency or a factor analysis of the scale; thus the reliability and

validity of the scale was unavailable at the time of the present study. Each item was rated on a dichotomous scale: 1--'yes,' 0--'no.'

**Anger:** Anger was assessed by the Korean adaptation of the State-Trait Expression Anger Inventory (STAXI-K, Chon, Hahn, & Lee, 1998). Factor analysis of the STAXI-K revealed the same factor structures to the original STAXI (Spielberger, 1988), consisting of state anger, trait anger, anger-in, anger-out, and anger-control. Each item was rated on a four-point scale; State anger was assessed by 1--'not at all,' 2--'somewhat,' 3--'moderately so,' and 4--'very much so,' while other scales (trait anger, anger-in, anger-out, and anger-control) were rated by 1--'almost never,' 2--'sometimes,' 3--'often,' and 4--'almost always.'

Note, in passing, that four items (two items for anger-in and another two for anger-out) were replaced by new items for the Korean adaptation of the STAXI. The replacement was made because several items had been problematic; these items were under different factor structures from the original STAXI. When replaced with four new items, however, all factor structures were the same as the original STAXI. It was shown that the STAXI-K has good internal consistencies, with Cronbach's alphas over .70 in all scales, except anger-in for female participants (.69). Test-retest reliabilities over a 3 week period were .65 to .82, except state anger (.14), consistent with the concept of state anger. Thus, the STAXI-K scores, except state anger, are reasonably stable over time (Meesters, Muris, & Backus, 1996).

### Additional measures

All participants were also required to provide demographic information, including gender, age,

educational level, marital status, religious orientation, and economic levels. Additionally, life styles information such as smoking and alcohol consumption were asked: how often and how long had they smoked? and how often and how much alcohol did they consume?

## RESULTS

As described above, stroke patients were collected from two university hospitals located in Seoul (19 patients) and Taegu (23 patients). Thus, in order to check whether the two groups were homogeneous, a t-test for continuous variables and

an  $\chi^2$  test for categorical variables were performed; five demographic variables (i.e., gender, age, marital status, educational level, and economic levels), and 78 psychological variables (34 items for TAB and 44 items for STAXI) were included for examination. The results showed that three out of 82 possible variables were shown to be significant, suggesting that two groups are homogeneous. Thus, subsequent analyses would be based on the combination of the two stroke groups as one.

### Characteristics of samples

Demographic characteristics of the samples

Table 1

Demographic Characteristics of Stroke and Low Back Pain Patients

Variable	Stroke patients (n = 42)		Pain patients (n = 36)		t	p
	M	SD	M	SD		
Age (in years)	57.60	10.16	45.56	13.02	4.48	.001
	N	%	N	%	$\chi^2$	p
Sex					3.84	.147
Male	30	71.4	18	50.0		
Female	12	28.6	18	50.0		
Religion					5.49	.482
Protestants	11	26.2	7	20.6		
Catholics	6	14.3	1	2.9		
Buddhists	16	38.1	18	52.9		
Miscellaneous	9	21.4	10	23.5		
Atheist						
Education					6.83	.337
Primary	13	31.0	6	17.6		
Junior high	1	2.4	5	14.7		
High	11	26.2	12	35.3		
College or Higher	17	40.5	11	32.4		
Marital status						
Married	42	100.0	36	100.0		NS
Income (ten thousand won per month)					15.20	.555
less than 50	6	16.7	3	8.8		
50 - 100	6	16.7	7	20.6		
100 - 200	11	30.6	21	61.8		
200 - 300	4	11.1	1	2.9		
Over 300	9	25.0	4	5.9		

revealed that there was significant difference in age, showing that stroke patients were older than low back pain patients,  $t = 4.48$ ,  $p < .001$ . No significance differences were found in other demographic variables.

In order to check any possible contaminating effect of the age variable on TAB and anger, correlations between age and psychological variables (i.e., TAB and anger) were calculated. It was found that there were no significant correlations between age and psychological variables: state anger ( $r = .11$ ), trait anger ( $r = .00$ ), anger-in ( $r = .06$ ), anger-out ( $r = -.09$ ), anger-control ( $r = .18$ ), tenseness ( $r = -.05$ ), ambition ( $r = -.09$ ), activity ( $r = .11$ ), unrepressed ( $r = .01$ ), suggesting that age may not be systematically influential on TAB or anger in the present study.

When life styles such as smoking and alcohol consumption were examined, there were no group differences between the stroke group and the low back pain group.

#### Internal consistencies of each scale

Before further analyses were performed, internal consistencies for each scale were calculated, and displayed in Table 2. Parenthetically, since there was not a sufficient number of participants in the present study, factor analysis was not performed. According to Chon and his colleagues (1998), however, STAXI-K revealed the same factor structures to the original STAXI, suggesting that STAXI-K is satisfactory in terms of construct validity. On the other hand, as alluded to above, the detailed information including the factor structure of TAB with a Korean sample has not yet been available. As can be seen in Table 2, all sub-scales in the STAXI-K showed satisfactory level of internal consistencies with the range of .76 to .90. On the other hand, the unrepressed sub-scale of TAB revealed .18, suggesting that it is too low level of internal consistency according to the recommended level of .60 (Nunnally, 1978). Thus, subsequent analyses will be based on all

Table 2  
Mean Scores, Standard Deviations, Number of Items, and Internal Alpha Reliabilities for the Scales

Scale	M	SD	Number of Items	Alpha
STAXI				
S-Anger	13.31	4.54	10	.90
T-Anger	19.04	5.02	10	.86
T-Anger/Temp	9.40	3.19	5	.83
T-Anger/Re	9.64	2.48	5	.76
AX/In	15.10	4.34	8	.76
AX/Out	13.79	4.05	8	.85
AX/Con	19.17	5.22	8	.84
TABP				
Tenseness	6.85	3.48	14	.75
Ambition	3.47	2.11	7	.71
Activity	5.01	1.79	7	.67
Unrepressed	3.69	1.25	6	.18

Note. S-Anger: State anger, T-Anger: Trait anger, T-Anger/Tem: Trait anger-temperament  
T-Anger/Re: Trait anger-reaction, AX/In: anger-in, AX/Out: anger-out, AX/Con: anger-control

sub-scales of STAXI-K, and only three sub-scales of TAB, excluding 'unrepressed' of TAB.

#### Comparisons of stroke with low back pain patients

The primary purpose of the present study was to understand the role of TAB and/or anger in stroke. By way of comparison, the present study employed the low back pain patients as a control group. In order to understand the group differences, a t-test was performed. As was shown

in Table 3, the stroke group revealed higher scores in trait anger,  $t = 2.16$ ,  $p < .034$ , especially trait anger-reaction,  $t = 2.03$ ,  $p < .046$  compared to the low back pain group. The stroke group also revealed higher scores in tenseness,  $t = 2.20$ ,  $p < .015$ , compared to the low back pain group.

#### TABP or anger on stroke

Since there were significant group differences between the stroke group and the low back pain group in terms of both TAB and anger, a logistic

Table 3  
Comparisons of Stroke Patients with Low Back Patients

Variable	Stroke patients		Pain patients		<i>t</i>	<i>p</i> ≤
	M	SD	M	SD		
S-Anger	13.90	5.42	12.69	3.50	1.18	.242
T-Anger	19.85	5.44	17.52	3.74	2.16	.034
T-Anger/Temp	9.78	3.50	8.56	2.31	1.79	.079
T-Anger/Re	10.10	2.59	8.97	2.22	2.03	.046
AX/In	15.21	4.33	14.81	4.38	.38	.707
AX/Out	13.90	4.58	13.34	3.29	.59	.556
AX/Con	19.68	5.43	18.30	5.12	1.11	.271
Tenseness	7.49	3.77	5.55	2.62	2.20	.015
Ambition	3.78	2.10	3.18	2.13	1.17	.246
Activity	5.24	1.27	4.88	1.87	.86	.394

Table 4  
Results of Logistic Regression Model Predicting Stroke from Age, Anger, and TAB

Variable	B	SE	Odds ratio	<i>p</i> ≤
Demographic				
Age	.165	.047	1.179	.001
Anger				
S-Anger	-.233	.122	.792	.055
T-Anger	.408	.186	1.503	.029
AX-In	.097	.130	1.102	.481
AX-Out	-.295	.191	.745	.122
AX-Control	-.073	.096	.929	.444
TAB				
Tenseness	.196	.197	1.217	.320
Ambition	.226	.216	1.304	.219
Activity	-.335	.277	.715	.226

Note. S-Anger: State anger, T-Anger: Trait anger, T-Anger/Temp: Trait anger-temperament  
T-Anger/Re: Trait anger-reaction, AX/In: anger-in, AX/Out: anger-out, AX/Con: anger-control



regression analysis was performed. More specifically, the age variable was included in the first step, then both anger (state anger, trait anger, anger-in, anger-out, and anger-control) and TAB (tenseness, ambition, and activity) were included as predictors, with the presence of stroke as the criterion variable in the regression equation.

As described in Table 4, age was shown to be an important predictor on the presence of stroke ( $p < .001$ ). Consistent with the previous analysis of group differences, trait anger ( $p < .029$ ) was shown to be an important predictor as to the presence of stroke. On the other hand, no variables in TAB revealed any significant effect on the presence of stroke. Thus, the present findings suggest that anger, but not TAB itself, appears to be an important psychological factor in strokes.

#### Comparisons of cerebral infarction with hemorrhage

As an additional quest to understand the relations between psychological factors and stroke,

we explored the subgroup differences between the cerebral infarction group and the hemorrhage group among stroke patients. Another  $t$ -test was performed, and the results are displayed in Table 5. As for the anger scales, the cerebral infarction group revealed higher scores than the hemorrhage group in trait anger,  $t = 2.03$ ,  $p < .050$ , anger-in,  $t = 3.29$ ,  $p < .003$ , anger-out,  $t = 2.52$ ,  $p < .017$ , and anger-control,  $t = 2.67$ ,  $p < .012$ . As for TAB sub-scales, there were significant group differences in tenseness,  $t = 2.62$ ,  $p < .013$ , and ambition,  $t = 2.60$ ,  $p < .024$ .

### DISCUSSION

The present study explored the role of TAB and/or anger in strokes. In order to understand the relations between psychological factors and strokes, low back pain patients were included as a control group. When the demographic variables were examined, there were no significant differences between stroke patients and low back pain

Table 5  
Comparisons of Infarction with Hemorrhage

Variable	Infarction (n = 29)		Hemorrhage (n = 11)		$t$	$p \leq$
	M	SD	M	SD		
S-Anger	14.00	5.96	14.00	4.47	.00	ns
T-Anger	20.64	6.11	17.90	2.23	2.03	.050
T-Anger/Temp	10.07	3.79	9.10	2.38	.94	.358
T-Anger/Re	10.57	2.92	9.00	1.27	2.34	.025
AX/In	16.26	4.56	12.40	2.46	3.29	.003
AX/Out	14.88	5.15	12.00	1.79	2.52	.017
AX/Con	20.63	5.74	16.55	3.50	2.67	.012
Tenseness	8.58	2.23	5.82	3.99	2.62	.013
Ambition	4.45	1.57	2.33	2.24	2.60	.024
Activity	5.27	1.71	5.27	1.79	.00	ns

Note. S-Anger: State anger, T-Anger: Trait anger, T-Anger/Tem: Trait anger-temperament

T-Anger/Re: Trait anger-reaction, AX/In: anger-in, AX/Out: anger-out, AX/Con: anger-control

patients, except the age variable. Since there were no any significant associations between age and TAB or anger, however, age doesn't seem to influence any group differences systematically via TAB or anger. Internal consistencies for each scale were satisfactory, except for the 'unrepressed' sub-scale of TAB with Cronbach's  $\alpha$  of .18, which was eliminated in subsequent analyses.

When a comparison was made between the stroke group and the low back pain group, the stroke group revealed higher scores both in trait anger and tenseness compared to the low back pain group. In a subsequent logistic regression analysis, however, anger, but not TAB, was shown to be an important psychological predictor of the presence of stroke. When an additional attempt was made to compare the cerebral infarction group with the hemorrhage group, the infarction group revealed higher scores in trait anger, anger-in, anger-out, anger-control (anger scale), tenseness and ambition (TAB scale).

The present findings suggest that, consistent with recent studies in Western countries, anger but not TAB itself seems to be a viable psychological factor in cardiovascular disease, including stroke. Since the sample in the present study was not sufficient enough, however, it remains to be seen whether the same pattern will be shown in future studies, especially in Korea.

The present findings underscore the importance of reliable measurements. As Breckler (1995) aptly pointed out, "an instrument should not be used if reliability and validity statistics are not available." (p. 163) Moreover, the evidence showed that reliability does not guarantee the validity of the scale. For example, TAB has been measured by a variety of instruments, including the Jenkins Activity Survey (JAS, Jenkins, Zyzanski, &

Rosenman, 1979). However, Friedman and Booth-Kewley (1987) pointed out that, although JAS had been used in a variety of studies with good internal consistency, its predictive validity was shown to be low, casting doubt on any further use in future studies. Thus, the use of reliable and valid instruments in future studies is highly recommended.

Given that anger is an important psychological factor in stroke, one question may arise: How does anger lead to stroke? One possible mechanism is that anger increases blood platelet aggregation, which in turn leads to stroke. Wenneberg, Schneider, Walton, MacLean, Levitsky, Mandarino, Waziri, and Wallace (1997) proposed a similar explanation: "exaggerated responses to stress of the sympathetic nervous system and the resultant surge of catecholamines in the cardiovascular system would stimulate platelets to aggregate, leading to occlusive thrombus formation in susceptible individuals." (p. 174) Indeed, similar relations were found between hostility and CHD. When CHD patients were compared with healthy controls, platelet activation was significantly associated with hostility among CHD patients, suggesting that anger may lead to cardiovascular disease, including stroke, via platelet activation (Markovitz, 1998). Although the present findings are in line with Wenneberg et al's study (1997) and Markovitz (1998), further research is needed to determine the specific mechanisms of how anger leads to cardiovascular diseases, including stroke.

The present findings also suggest that anger may be more saliently operating within the cerebral infarction group. In fact, Kim et al (1998) reported similar findings that the tenseness of TAB may be a risk factor for cerebral infarction, but not for hemorrhage. With respect to hostility,



it appears to be more prevalent in those who have already developed a considerable degree of atherogenesis in cardiovascular diseases (Markovitz, 1998). Thus, the ill effects of anger may be more salient in cerebral infarction stroke. Further research with more specific subgroups of stroke is needed to explore this relationship.

It is not clear why the infarction group, when compared to the hemorrhage group, revealed higher scores in all anger expression styles, anger-in, anger-out, and anger-control. Due to the exploratory nature of the present study, it remains to be seen whether the present findings will be repeated in future studies. Similar findings found, however, that those who scored high in both anger-control and anger-out were likely to suffer from atherosclerosis (Julkunen, Salonen, Kaplan, Chesney, & Salonen, 1994), which in turn may lead to cerebral infarction (see Wenneberg et al., 1997).

Given that there is some truth in the present findings, there is a dire need to establish anger management programs at university hospitals in Korea. Following trends in Europe could also provide some insightful implications for what is needed in Korea in the near future. Maes (1992) described that from 20% to almost 100% countries in Europe provided psychosocial care for cardiac rehabilitation patients after dismissal from the hospital. At the moment, there is no one to administer anger management programs, as part of either cardiac rehabilitation or stroke rehabilitation in Korea, and virtually no one to provide sufficient psychosocial rehabilitation. Thus, it is worthwhile pursuing prevention, intervention, and rehabilitation from a psychological perspective, especially a health psychological perspective in Korea.

## REFERENCES

### Written in Korean

- Yoo, H. J. (1990). *The relationship between coronary heart disease and the dimensions of psychoticism and reactivity*. Paper presented at the Annual Convention of the Korean Psychological Association.

### Written in English

- Bages, N., Warwick-Evans, L., & Flager, P. R. J. (1997). Differences between informants about Type A, anger, and social support and the relationship with blood pressure. *Psychology and Health, 12*, 453-465.
- Breckler, S. J. (1995). Psychosocial resource variables in cancer research: Statistical and analytical considerations. *Journal of Psychosocial Oncology, 13*, 161-176.
- Chon, K. K., Hahn, D. W., & Lee, C. H. (1998). Korean adaptation of the State-Trait Anger Expression Inventory (STAXI-K): The case of college students. *Korean Journal of Health Psychology, 3*, 18-32.
- Dembroski, T. M., & MacDougall, J. M. (1985). Beyond global Type A: Relationship of paralinguistic attributes, hostility, and anger-in to coronary heart disease. In T. Field, P. McCabe, & N. Schneiderman (Eds.), *Stress and coping*. Hillsdale, NJ: Erlbaum.
- Everson, S. A., Goldberg, D. E., Kaplan, G. A., Julkunen, J., & Salonen, J. T. (1998). Anger expression and incident hypertension. *Psychosomatic Medicine, 60*, 730-735.
- Everson, S. A., Kaplan, G. A., Goldberg, D. E., Lakka, T. A., Sivenius, J., & Salonen, J. T. (1999). Anger expression and incident stroke: prospective evidence from the Kuopio ischemic

- heart diseases study. *Stroke*, 30, 523-528.
- Eysenck, H., & Fulker, D. (1983). The components of Type A Behavior and its genetic determinants. *Personality and Individual Differences*, 4, 499-505.
- Friedman, H. S., & Booth-Kewley, S. (1987). The "disease-prone personality": A meta-analytic view of the construct. *American Psychologist*, 42, 539-555.
- Freidman, M., & Rosenman, R. H. (1974). *Type A behavior and your heart*. New York: Knopf.
- Jenkins, C. D., Zyzanski, S. J., & Rosenman, R. H. (1979). *JAS Manual*. New York: The Psychological Corporation.
- Julkunen, J., Salonen, R., Kaplan, G. A., Chesney, M. A., & Salonen, J. T. (1994). Hostility and the progression of carotid atherosclerosis. *Psychosomatic Medicine*, 56, 519-525.
- Kawachi, I., Sparrow, D., Spiro, A., III, Vokonas, P., & Weiss, S. T. (1996). A prospective study of anger and coronary heart disease: the Normative Aging Study. *Circulation*, 94, 2090-2095.
- Kim, J. S., Yoon, S. S., Lee, S. I., Yoo, H. J., Kim, C. Y., Choi-Kwon, S., & Lee, B. C. (1998). Type A Behavior and stroke: High tenseness dimension may be a risk factor for cerebral infarction. *European Neurology*, 39, 168-173.
- Leon, G. R., Finn, S. E., Murray, D., & Bailey, J. M. (1988). The inability to predict cardiovascular disease from hostility scores of MMPI items related to Type A behavior. *Journal of Consulting and Clinical Psychology*, 56, 597-600.
- Maes, S. (1992). Psychosocial aspects of cardiac rehabilitation in Europe. *British Journal of Clinical Psychology*, 31, 473-483.
- Markovitz, J. H. (1998). Hostility is associated with increased platelet activation in coronary heart disease. *Psychosomatic Medicine*, 60, 586-591.
- Meesters, C. M. G., Muris, P., & Backus, I. P. G. (1996). Dimensions of hostility and myocardial infarction in adult males. *Journal of Psychosomatic Research*, 40, 21-28.
- Mittleman, M. A., Maclure, M., Sherwood, J. B., Mulry, R. P., Tofler, G. H., Jacobs, S. C., Friedman, R., Benson, H., & Muller, J. E. (1995). Triggering of acute myocardial infarction onset by episodes of anger: determinants of myocardial infarction onset study investigators. *Circulation*, 92, 1720-1725.
- Nunnally, J. C. (1978). *Psychometric theory*. New York: McGraw-Hill.
- Sacco, R. L., Benjamin, E. J., Broderick, J. P., Dyken, M., Easton, J. D., Feinberg, W. M., Goldstein, L. B., Gorelick, P. B., Howard, G., Kittner, S. J., Manolio, T. A., Whisnant, J. P., & Wolf, P. A. (1997). American Heart Association Prevention Conference, IV: prevention and rehabilitation of stroke: risk factors, *Stroke*, 28, 1507-1517.
- Siegleman, A. W., Townsend, S. T., Blumenthal, R. S., Sorkin, J. D., & Civelek, A. C. (1998). Dimensions of anger and CHD in men and women: Self-ratings versus spouse ratings. *Journal of Behavioral Medicine*, 21, 315-336.
- Spicer, J., & Chamberlain, K. (1996). Cynical hostility, anger, and resting blood pressure. *Journal of Psychosomatic Research*, 40, 359-368.
- Spielberger, C. D. (1988). *Professional manual for the State-Trait Anger Expression Inventory* (STAXI, Research ed.), Tampa, FL: Psychological Assessment Resources, Inc.
- Spielberger, C. D., Reheiser, E. C., & Sydeman, S. J. (1995). Measuring the experience, expression,

and control of anger. In H. Kassirer (Ed.), *Anger disorders: Definitions, diagnosis, and treatment* (pp. 49-67). Washington, DC: Taylor & Francis.

Spielberger, C. D., Johnson, E. H., Russell, S. F., Crane, R. J., Jacobs, G. A., & Worden, T. J. (1985). The experience and expression of anger: Construction and validation of an anger expression scale. In M. A. Chesney & R. H. Rosenman (Eds.), *Anger and hostility in cardiovascular and behavioral disorders*. Washington DC: Hemisphere.

Wenneberg, S. R., Schneider, R. H., Walton, K. G., MacLean, C. R. K., Levitsky, D. K., Mandarino, J. V., Waziri, R., & Wallace, R. K. (1997). Anger expression correlates with platelet aggregation. *Behavioral Medicine*, 22, 174-177.

## 뇌졸중 환자의 A형 행동 유형과 분노

전경구    전중선    안신호    장성호    박은희    Spielberg, C. D.

대구대    포천의과대    영남대    영남대    연세대    Department of Psychology  
 재활심리학과    재활의학과    재활의학과    재활의학과    재활의학과    University of South Florida

본 논문에서는 뇌졸중 환자의 A 행동 유형과 분노를 살펴보았다. 연구의 참여자는 42명의 뇌졸중 환자와 36명의 요통 환자들이었다. 연구에서 사용한 주요 척도는 A 행동 유형 척도(긴장, 야심, 활동성, 및 탈억제)와 분노 척도(상태 분노, 특성 분노, 분노 억제, 분노 표출, 및 분노 통제)이었다. 두 집단간에 차이를 검증해 본 결과, 뇌졸중 환자 집단이 요통 환자 집단에 비하여 특성 분노와 긴장 척도에서 높게 나타났다. 그러나 logistic 회귀분석을 실시한 결과, 특성 분노 변인이 유의한 예언 변인으로 나타난 반면에 긴장은 그렇지 못했다. 뇌졸중 환자를 뇌경색 집단과 뇌출혈 집단으로 구분해서 비교한 결과, 뇌경색 집단이 뇌출혈 집단에 비하여 특성 분노, 분노 억제, 분노 표출, 분노 통제, 긴장과 야심 척도에서 모두 유의하게 높은 점수를 보였다. 본 연구의 이러한 결과는 최근 연구 결과들과 일관되게 A 행동 유형 개념보다는 분노가 뇌혈관계 질환에 영향을 미치는 더 의미 있는 심리적 변인임을 암시하고 있었다.