

STRESS MANAGEMENT STRATEGIES IN HYPERTENSION CONTROL

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INTRODUCTION

An expansive body of literature supports an association between stress and hypertension. Cross-sectional, case control, and prospective studies in a variety of populations have provided evidence consistent with this relationship.¹⁻³ In terms of cardiovascular disease, long-term stress is thought to sensitize arterioles to catecholamines resulting in overconstriction of the vessels and endothelial damage. Repetitive overconstriction can lead to hypertension as well as decreased myocardial perfusion and arrhythmias.⁴ It has been suggested that African Americans are continually exposed to stressors within a Westernized culture.⁵⁻⁷ Stressors for African Americans may include exposure to racism, lack of resources and social support, social-familial factors, and lower occupational status.⁸ In a study using focus group methods, African-American women described the inherent stress they experienced in their daily lives. The perceived need for overachievement in order to gain recognition, to overcome limited resources and daily assaults on their dignity in the workplace, and to serve in multiple role responsibilities were identified as contributing to their continually stressful lives.⁹

In contrast to African Americans, Black populations residing in underdeveloped nations typically have lower mean blood pressures, which remain so throughout adulthood.⁶ However, when members of low blood pressure populations experience modernization, either through migration to Western societies or through a "westernization" of their own societies, mean blood pressures become higher and remain elevated throughout adulthood. Greater exposure to environmental and internal stressors provide a mechanism for translation of such repeated exposures to: 1) vascular

changes producing earlier increases in total peripheral resistance; and 2) localized changes in vascular resistance.¹⁰

THEORY OF PSYCHOLOGICAL STRESS

Hypertension has been conceptualized as a multifactorial disease, which includes both physiological and psychological factors, resulting from reaction to stressful situations. Richard Lazarus' theory of psychological stress is one of the most widely used and forms the theoretical framework for many stress management therapies. Lazarus conceptualized stress as a transactional process in which the person and environment are seen in an ongoing relationship of reciprocal action.¹¹ Two factors mediate the stress process, appraisal and coping. Appraisal is the cognitive activity in which a personal threat or challenge is evaluated or interpreted as threatening, challenging, or harmful. Coping is the cognitive and behavioral efforts put forth to master, tolerate, or reduce internal or external demands. Cognitive and behavioral efforts are constantly changing as a function of continuous appraisals and re-appraisals of the person-environment relationship. Coping processes are directed at altering the situation that is causing the distress (problem-focused coping) and/or regulating the emotional distress (emotion-focused coping). In this theory, stress does not refer to a specific variable but is a general organizing concept for understanding a wide range of phenomena for describing human adaptation. Lazarus uses the perspective of the specific person perceived as a thinking, feeling person who is continually appraising his or her relationship within the surrounding environment.¹¹

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Spielberger^{12,13} modified Lazarus' theory of psychological stress by conceptualizing stress as a psychophysiological process that consists of 3 elements: the stressor, the perception of the stressor, and an emotional response to the stressor. In Spielberger's conceptualization, stress involves a sequence of temporally ordered events initiated by situational stressors that are perceived as threatening, ie, frustrating, challenging, or unfair. This perception results in an emotional response of anxiety, anger, or fear. Appraisal of a stressor is influenced by an individual's attitudes, abilities, and past experiences. The intensity of the emotional reaction will be proportional to the amount of the perceived threat. Concurrent with the emotional response is the biological component of autonomic nervous system arousal, which is evidenced by increased heart rate and blood pressure. Frequently experienced stressors may evoke the use of defense mechanisms, such as denial or projection, which can result in unhealthy behaviors aimed at managing the stressors.¹²

Studies on emotions and behaviors associated with the psychological stress process have identified anger, anger expression style, and coping behaviors to have particular relevance for Black men and women. In the now classic Detroit Study,¹⁴ anger suppression, when combined with factors such as race, sex, and socioecological stress, created group differences in "at-risk" status for hypertension. At-risk categories ranged from less than 7% (White females residing in low stress areas who expressed their anger openly) to 39% (for Black males, residing in high stress areas who reported regularly suppressing anger). A follow-up study noted that anger-coping style could mediate the otherwise pathologic relationship between life strain (conceptualized as job strain and family strain) and elevated blood pressure. Blacks who were high in either type of life strain and who suppressed their anger in day-to-day situations (including those in-

volving spouse, children, and employees) had significantly higher diastolic blood pressure compared to Blacks and Whites who did not experience strain and/or who expressed their anger as they experienced it.⁵

The current Coronary Artery Risk Development in Young Adults Study (CARDIA) lends support to Spielberger's hypothesis that frequently experienced stressors, which result in anger, can result in unhealthy behaviors.¹⁵ Hostility, which has also been associated with cardiovascular reactivity, implies a complex set of attitudes that can motivate behavior and lead to the frequent experience of anger. In the CARDIA study, hostility was found to be associated with an increased prevalence of alcohol consumption, cigarette smoking, and caloric intake in both Blacks and Whites. Findings from this study have also shown that hostility scores are significantly higher in Blacks than in Whites.

A natural occurrence of the identified association between psychological stress and hypertension has been the use of stress management therapy. Although stress management therapies may not provide definitive therapy or prevent hypertension, some studies have found small but significant decreases in blood pressure.¹⁶⁻¹⁹ More recent studies have shown that cardiac patients may experience lower triglycerides, a decreased incidence of new coronary events, and reduced ischemia when experiencing mental stress.²⁰⁻²² Stress management interventions also have reported efficacy in reducing stress-related emotional responses of anger.²³⁻²⁶ Although stress management has been studied widely in the general population, there are few published clinical trial studies involving African Americans. As part of the 2000 strategic plan of the National Heart, Lung, and Blood Institute, the development and testing of interventions to improve health behaviors and outcomes in minority individuals was cited as the number one goal for reducing health disparities.

COGNITIVE BEHAVIOR THERAPY

Stress management is based on the view that problems develop when a person uses inappropriate or ineffectual attempts to cope with a perceived imbalance between demands and resources.²⁷ This approach attempts to teach new coping skills so that the person can manage his or her environment with less distress. Cognitive behavior therapy, a type of stress management, emphasizes improving a person's competency in handling significant aspects of the surrounding world.²⁷ The goal of cognitive-behavioral therapy is to help the individual improve coping skills by becoming competent in managing stressful aspects of the environment. Competency depends both on possessing the necessary cognitive and behavioral skills to confront a given stressor, and on being able to mobilize these skills whenever necessary. The cognitive-behavioral model has been used in the majority of intervention programs for the treatment of negative emotional states, such as anger. The core components of a cognitive-behavioral intervention include: 1) arousal and emotional reduction methods; and 2) teaching the individual cognitive mediation techniques.

Arousal and emotional reduction methods may consist of a variety of relaxation techniques, such as muscle relaxation, autogenic training, guided imagery, breathing exercises, meditation, and yoga. These procedures elicit an increase in the response of the parasympathetic nervous system and the elicitation of the relaxation response.²⁸ This response results in bodily changes that lower blood pressure, heart rate, oxygen consumption, and respiratory rate as well as other physiological parameters such as muscle tension or peripheral skin temperature. To be effective, relaxation procedures should be supplemented with some form of biofeedback indices. Biofeedback uses electronic in-

struments to measure, process, and provide information to patients regarding their neuromuscular and autonomic nervous system activity in the form of analogue/binary and auditory/visual signals. Biofeedback equipment typically provides the trainer and the patient with information on physiological indicators of relaxation such as blood pressure, pulse rate, respiration rate, muscle tension (EMG), brain wave activity (EEG), skin (thermal) temperature, and galvanic skin response.²⁹

Cognitive mediation (also known as cognitive restructuring) is intended to assist the patient in changing their reaction to stress and emotional states such as anxiety and anger. Frequent methods used for this type of therapy include: cognitive restructuring in which negative self-messages are replaced with positive self-promoting thoughts; anger management; improved communication skills; development of problem solving coping skills; increasing awareness of stressors and stress responses; reevaluating negative events; management of negative emotions; assertiveness training; coping with confrontational situations; and time management.

EFFICACY OF STRESS MANAGEMENT

Despite the apparent need of stress reduction therapy for African Americans, the efficacy of these interventions in the management of hypertension remains unsubstantiated. In 1989, the Canadian Consensus Conference on Non-Pharmacological Approaches to the Management of High Blood Pressure wrote that there was no convincing evidence that relaxation/stress management reduces the probability of hypertension.³⁰ In 1997, the sixth report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-VI)³¹ addressed lifestyle modifi-

cations for the treatment of hypertension, ie, sodium and alcohol restriction, physical exercise, weight control, and smoking cessation. Stress management was not addressed; only relaxation and biofeedback were discussed. The JNC-VI report indicated that the efficacy of biofeedback and relaxation in treating patients with elevated blood pressure was uncertain. These recommendations were, however, based on only 3 trials, none of which used a biofeedback component. Nonetheless, the JNC-VI was unable to support the use of stress management for definitive therapy or prevention of hypertension.

Several meta-analyses have been done to empirically determine the effect of these therapies and serve to provide a better understanding as to why so much ambiguity exists today.³²⁻³⁵ These analytical reviews have acknowledged that certain types of stress management therapy can produce decreases in blood pressure when the individual is presented with an acute stressor. However, it is the long-term efficacy of these therapies that remains uncertain. Additionally, a number of research methodological issues have been identified. Methodological issues include a lack of a standardized intervention, lack of appropriate control groups, lack of random assignment to groups, small sample sizes, lack of long-range benefits, lack of control over subjects on hypertensive therapy, and lack of control for "white-coat hypertension."

In response to the JNC-VI report on biofeedback and relaxation, Yucha and colleagues conducted a meta-analysis to evaluate biofeedback training.³⁵ Their findings revealed that biofeedback, with related cognitive therapy and relaxation training, can reduce both systolic (6.7 mm Hg) and diastolic blood pressure (4.8 mm Hg) significantly when compared with inactive control treatments. They acknowledge that, although the differences between biofeedback and control groups were significant, they were small suggesting

that biofeedback may be most useful for the high-normal or Stage 1 or 2 hypertensive patient. Of the various types of biofeedback, the researchers recommended those providing thermal and electrodermal activity.

A recent review of the literature by the author found only 3 studies that included only African Americans. Two studies evaluated the use of transcendental meditation in older African Americans and found the effects of the meditation on blood pressure to have beneficial results.^{16,17} A later study found that the transcendental meditation procedure was not effective on blood pressure but did decrease the carotid intima-media thickness.³⁶ A large, multi-site, randomized clinical trial is indicated to further evaluate the effects of these encouraging results.

Our review also found little data supporting the long-term benefits of stress management. Prospective studies appear to be limited to work done by Patel and colleagues who have evaluated training in relaxation and stress management for almost 20 years in England.³⁶ Their protocol consists of an integrated approach of both cognitive meditation and relaxation procedures. The training takes place over 8 weeks and includes meditation, relaxation, the concept of biofeedback, breathing exercises, as well as identifying stressors, use of social support, and managing emotions. This study is unique because of its longevity and long-term follow-up evaluations. In Patel's most recent controlled trial, blood pressure reductions were maintained after 4 years and there was a strong suggestion of a reduction in cardiovascular morbidity.

IMPLICATIONS FOR CLINICAL PRACTICE

The clinician who provides care to the patient with hypertension or elevated blood pressure will encounter patients who: 1) attribute their hyperten-

sion to stress; or 2) report physical, behavioral, emotional or cognitive symptoms they attribute to stress. Responding to their beliefs or concerns requires that the practicing clinician be able to recognize known indices of stress overload in their patient, possess current knowledge regarding the empirical data on stress management, and have a familiarity of legitimate stress management practitioners in the community.

Stress is not only linked to hypertension and heart disease, but decreased life satisfaction, the development of mental disorders, the occurrence of stress-related illness (eg, gastrointestinal disorders, low back pain, headaches) and decreased immunological functioning. Clinicians are now being asked to screen each and every patient for signs of clinical depression. Similarly, screening patients for signs of stress-induced diseases and symptoms should be considered. Incorporating brief questions that ask the patient to tell how they are managing stress or if they are encountering any excessive or new stressors is critical. There are numerous self-report surveys that can easily be administered to the patient and should be done at least once a year. One particularly useful instrument is the Holmes and Rahe Life-Change Index³⁸ designed to measure the extent of life change in the recent past. Life changes are defined as dramatic and taxing events (eg, death of a spouse, marriage, loss of a family member) that require significant readjustment. The number of changes occurring within any given 2-year periods has been shown to be predictive of subsequent illness, including heart disease.

Patients should also be counseled that, although they may be experiencing a great deal of stress, many other factors may contribute to their hypertension or high blood pressure. Lifestyle modifications in the form of exercise, dietary modification, sodium restriction, smoking cessation, and alcohol restriction are always indicated. Patients should also be counseled that

research has shown that individuals who perceive they are under a great deal of stress often neglect healthy behaviors such as exercise and may lack the energy and stamina they formerly had. Ineffective coping behaviors may cause them to resort to less than optimal dietary practices, while some patients may turn to increased use of alcohol and tobacco. A number of helpful pamphlets and books are currently available for African Americans that explain the interactive effects of stress on the person. The American Heart Association and the National Heart, Lung, and Blood Institute both offer free information on the Internet. The book *Brothers on the Mend*³⁹ addresses health issues for African-American men and women and has an extensive, but readable, section on stress management techniques. A more recent publication, *The Black Man's Guide to Good Health*,⁴⁰ offers critical advice for African-American men and their families and includes a section of helpful methods for managing stress. Patients will also find a vast array of contemporary, over-the-counter remedies through bookstores, health food stores, and the Internet. Although some of these may be useful, patients should be advised to use caution to avoid false remedies, quackery, and the risk of losing money.

The decision to suggest more formal stress management is a more complicated process, as caution needs to be exercised again in the choice of programs and therapist. Formal programs can be costly and frequently are not covered by insurance companies unless related to an injury or trauma. Our review found that using a combination of cognitive and relaxation therapies such as those used by Patel³⁶ produced the greatest effects on blood pressure. Ideally, the stress management therapy should include some type of biofeedback so that the trainer and the patient have some indication of their ability to relax and reduce the sympathetic nervous stimulation. One of the inherent

components of relaxation training is ensuring that the patient learns to recognize signs of enhanced parasympathetic activity. A good therapist will have access to biofeedback equipment, which may provide data on EMG activity, heart rate, respiratory rate, blood pressure, and thermal temperature. Patients can also be exposed to stressors during stress management classes and observe how cardiovascular parameters are affected, ie, blood pressure, heart rate, thermal temperature. A number of inexpensive biofeedback instruments can be obtained for home use that allows the patient, albeit less accurately, to monitor their reactivity at home.

Patients need to be advised that truly learning to reduce stress requires a commitment. For a successful outcome 3 components must be considered: 1) the program should be comprehensive enough to provide the patient with adequate strategies to deal with different situations and needs, as well as the integration of relaxed behavior modes into their daily life; 2) the therapist must be committed to the therapy and be enthusiastic and able to interact well with the patient; and 3) patients must be willing to comply, have a favorable attitude to therapy, and have the time to practice relaxation.³⁷ Patients also need to be advised that the commitment to lifestyle change is a lifetime responsibility, and that not all patients respond the same way or positively. Currently, the literature suggests that although stress management is effective in relieving psychological distress, the ability to effectively lower blood pressure and to maintain this reduction is not feasible for all patients. Perhaps the most important gain from stress management therapy is the ability to appraise and cope with stressors more effectively, thus allowing the patient to live a healthier lifestyle.

CONCLUSION

The early diagnosis and treatment of hypertension and promotion of risk-re-

ducing behaviors offers the only hope of decreasing the tragic effect of this disease on the African-American population. Pharmacological therapy remains the most efficacious therapy in the management of hypertension. Encouraging the incorporation of risk-reducing behavior offers the opportunity to further decrease the severity of the disease or the risk of the disease. Assisting African Americans to effectively appraise and cope with stressors inherent in our society serves to help decrease the known cardiovascular reactivity elicited by the stress process. The African American who seeks assistance for managing stress is apt to find a paucity of resources that are appropriate for their needs. These same individuals may feel hesitant to enroll in programs that appear to be designed for the Caucasian population. The lack of clinical trials with African Americans underscores the need for such research so that effective stress management therapies can be developed and prescribed for these individuals. Meanwhile, resources within the African-American community should be pooled in an effort to meet the needs of their residents.

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