Stress Management and Hypertension

Yasser Sharaf, MD
Professor of Cardiology, Cairo Univ.
Questions raised

- What is “STRESS”? 
- Does stress lead to hypertension? 
- How does stress affect the CV system? 
- What is stress management? 
- Does stress management reduce blood pressure in hypertensive subjects?
Mental Stress

Definition:
Stress is an imbalance between environmental demands (Stressors) and the ability to meet them.

Stress may be:
- Emotional (Situation, place, person(s),....)
- Socciocultral
- Occupational
Acute Reaction to Stress

Stress

- Muscle tension
- Tachycardia
- Elevation of BP
Possible Sequelae of Chronic Stress

- Depression
- Anxiety
- Somatization
- Post-traumatic stress disorder

- Atherosclerosis
- HTN
- Peptic ulcer
- Cancer
- Immune related diseases
### Mental Stress & Hypertension

<table>
<thead>
<tr>
<th>Study</th>
<th>No</th>
<th>Variable</th>
<th>Hypertension rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kahn et al. 1972</td>
<td>3829</td>
<td>Social support, Anger-in</td>
<td>10</td>
</tr>
<tr>
<td>McClelland 1979</td>
<td>78</td>
<td>Anger-in</td>
<td>1.6</td>
</tr>
<tr>
<td>Jenkins 1981</td>
<td>231</td>
<td>Anger</td>
<td>-</td>
</tr>
<tr>
<td>Markovitz et al. 1990</td>
<td>468</td>
<td>Trait anger, Anger-in, Anger-out, Anxiety</td>
<td>&lt;1.0</td>
</tr>
<tr>
<td>Pernini et al. 1991</td>
<td>121</td>
<td>Anger-in, Anxiety</td>
<td>5.6</td>
</tr>
<tr>
<td>Markovitz et al. 1993</td>
<td>1123</td>
<td>Anger-in, Anxiety, Anger-out</td>
<td>2.6</td>
</tr>
<tr>
<td>Somova et al. 1995</td>
<td>501</td>
<td>Anger-in, Anger-out, Anxiety</td>
<td>-</td>
</tr>
<tr>
<td>Jonas et al. 1997</td>
<td>2992</td>
<td>Anxiety, Depression</td>
<td>1.9</td>
</tr>
<tr>
<td>Everson et al. 1998</td>
<td>537</td>
<td>Anger-out, Anger-in, Anger control</td>
<td>4.9</td>
</tr>
<tr>
<td>Rutledge et al. 2000</td>
<td>127</td>
<td>Defensiveness</td>
<td>4</td>
</tr>
<tr>
<td>Everson et al. 2000</td>
<td>616</td>
<td>Hopelessness, Depression</td>
<td>5.1</td>
</tr>
<tr>
<td>Spiro et al. 1995</td>
<td>838</td>
<td>Neuroticism</td>
<td>2.2</td>
</tr>
<tr>
<td>Davidson et al. 2000</td>
<td>3343</td>
<td>Depression</td>
<td>0.7</td>
</tr>
<tr>
<td>Siegler et al. 1992</td>
<td>4650</td>
<td>Hostility</td>
<td>0.3</td>
</tr>
<tr>
<td>Vaillant et al. 1996</td>
<td>193</td>
<td>Psychopathology</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Mental Stress & Hypertension

Everson et al
Everson et al
Everson et al
Everson et al
Everson et al
Everson et al
Everson et al
Everson et al
Jonas et al
Jonas et al
Kahn et al
Kahn et al
Mclelland et al
Markovitz et al
Spiro et al
Rutledge et al
Davidson et al

Anger-out
Anger-in
Anger control
Hopelessness
Depression
Anxiety
Depression
Social network size
Anger-in
Anger-in
Anxiety
Neuroticism
Defensiveness
Depression

Mechanisms That Link Stress to CVD

I. CV/neuro-endocrine reactivity to stress
- Shear stress
- Platelet activation
- Increased inflammatory cytokines
- Increased expression of metabolic syndrome

II. Unhealthy behavior associated with stress
- Smoking
- Increased caloric intake
- Increased alcohol intake
Stress management

Rationale:

external circumstances do not have any intrinsic capacity to produce stress, but instead their effect is mediated by the individual's perceptions, capacities, and understanding.

Stress management models:

- **Transreactional model.** This breaks the stressor-stress link by changing the perception of stressors and enhancing coping strategies.

- **Health realization model.** This model focuses on the nature of thought, helping the individual to avoid insecure and negative thinking and approach the world with quiet mind, inner wisdom, and common sense.
Stress management: Techniques

I. Stress relaxation:
- Breathing exercises
- Progressive muscle relaxation
- Yoga
- Tai chi
- Massage

II. Biofeedback techniques.

III. Meditation.

IV. Cognitive therapy.
Biofeedback

By providing access to physiological information about which the user is generally unaware, biofeedback allows users to gain control over physical processes previously considered automatic.

Neal Miller (psychologist) and his team introduced the concept of biofeedback in the 1960s.

Types of biofeedback instrumentation:
- Electromyogram (EMG)
- Peripheral skin temperature
- Galvanic skin response training
- Electroencephalography (EEG)
Meditation

Quiet the mind and engage in exercises that help you focus on your breathing, an object, or your body sensations. The goal is to relax the mind, body and spirit.

Meditation is often recognized as a component of Eastern religions, where it has been practiced for over 5,000 years.

It encompasses any of a wide variety of spiritual practices which emphasize mental activity or quiescence.
Cognitive Therapy

**Change thoughts and response**
- Have realistic expectations.
- Reframe problems.
- Maintain your sense of humor.
- Express your feelings instead of bottling them up.
- Don’t try to control events or other people.
- Ask yourself “Is this my problem?”

**How to Cope with stresses**
- Manage time.
- Give priority to the most important tasks and do those first.
- Schedule time for both work and recreation.
- Delegate tasks and break up big projects.
Stress Management and Hypertension

Stress Management and Hypertension

Stress Management and Hypertension

## Stress Management & Guidelines for HTN Management

<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Stress management</th>
</tr>
</thead>
<tbody>
<tr>
<td>JNC VII 2005</td>
<td>Ignored</td>
</tr>
<tr>
<td>BHS 2004</td>
<td>Ignored</td>
</tr>
<tr>
<td>ISH 2003</td>
<td>Ignored</td>
</tr>
<tr>
<td>EHS 2003</td>
<td>Ignored</td>
</tr>
<tr>
<td>CHEP 2007</td>
<td>Recommended for selected group of pts</td>
</tr>
</tbody>
</table>
Recommendations of Canadian Society of Hypertension

In patients with hypertension, the contribution of stress should be considered (grade D recommendation).

For hypertensive patients in whom stress appears to be an important issue, stress management should be considered as an intervention. Individualized cognitive behavioral interventions are more likely to be effective than single-component interventions (grade B recommendation).

Spence JD, et al. Recommendations on stress management. JAMC • 4 MAI 1999; 160 (9 Suppl.)