

STRESS (psychological stress)

By: Sondos Al-Najjar

Definition of stress:

As a medical term; stress is the disruption of homeostasis through physical or psychological stimulus.

Selye's definition of stress: body's physiological response to psychological and physical demand (stressors)

Psychological distress results from three types of experiences:

- Pressure
- conflict
- frustration

Special stressful events

- serious physical illness
- terminal illness
- bereavement

The stressor:

A stressor is a stimulus or event that provokes a stress response in an organism. And this stressor can be acute or chronic, external or internal, physical or emotional/mental/psychological and finally it could be unpleasant (distress) or pleasant (eustress).

Common stressors:

- 1- sensory: pain, bright light
- 2- life events: birth, death, mirage and divorce
- 3- responsibilities: lack of money, unemployment
- 4- work/study: exams, deadlines
- 5- personal relationships: conflict, deception
- 6- lifestyle: heavy drinking, insufficient sleep
- 7- early life exposure: child abuse
- 8- lack of control over environmental circumstances: food, housing, health, freedom, mobility

**Note: both negative and positive stressors can lead to stress*

Components of the stress response:

- 1- emotional (fear, anxiety and depression) and it's accompanied by somatic changes
- 2- psychological (to reduce the potential impact of the experiences like:
 - ☞ impaired recall and numbness
 - ☞ coping strategies
 - ☞ defense mechanism

Coping strategies:

1- Adaptive

- avoidance
- working through problems
- coming to terms with situations

2- Maladaptive

- suitable abuse
- histrionic or aggressive behavior
- deliberate self harm

3- Culturally determined

Individual's response to a stressor:

- physiological reactivity
- cognitive appraisal
- control

- Type A behavior
- Hostility
- Antagonism with others

Stress symptoms:

- unusual heart beat (fast, pounding, irregular)
- unusual breathing (fast, shallow)
- restless feeling(feels like you have to move)
- muscles feel tight or tens
- frequent aches and pain
- headache, often get flu or cold
- feels warm or hot when it's not hot
- sweat more than normal
- dry mouth and fatigue
- nervous stomach (gas, diarrhea and constipation)
- heartburn, nausea, loss or increase in appetite
- urinate more than normal
- obsessive worrying
- lack of concentration and memory loss
- feeling self-consciousness, shy and lonely, uncomfort, irritability
- seriousness dissatisfaction, fear, anxiety, anger, panic
- depressed mood, unhappiness, crying
- insomnia
- sexual problems

General adaptation syndrome (GAS)

A term used by Selye to describe the body's short-term and long-term reactions to stress and it involves two major systems of the body: (1) Nervous system and (2) Endocrine/hormonal.

And there are three distinctive stages for this adaptation:

- 1- Alarm reaction
- 2- Resistant
- 3- Exhaustion

We'll talk about each stage in more details.

Alarm reaction

It's the immediate reaction to a stressor, the fight or flight response which prepares the body for physical activity.

This response can decrease the effectiveness of immune system, making the person more susceptible to illnesses during this phase.

Resistance

AKA **stage of adaptation**. During this phase, if the stress continues, the body adapts to the stressors. And changes at many levels take place in order to reduce the effectiveness of the stressor.

Example: if the stressor is starvation, the person might experience a reduced desire for physical activity to conserve energy, and nutrients absorption from the body will be maximized.

Exhaustion

When the stress continues for some time, the body's resistance to the stress may be gradually reduced. Here in this stage, the immune system, and body's ability to resist diseases, may be almost totally eliminated.

The patient may develop heart attack or severe infections due to the reduced immunity.

Example: a person with stressful job (long term stress) might develop high blood pressure and consequently heart attack.

Now let's talk about the neurochemistry and physiology of the GAS
"General Adaptation Syndrome". Next page

- Stress activates the **sympathetic** division of ANS and release **epinephrine and cortisol**.
- Sympathetic output produces **fight or flight** response, causing the body to divert blood flow to large muscles.
- Less blood supply to the digestive system and other organs lead to: **dry mouth, sweating, pallor, enlarged pupils and insomnia**.
- The stressor can cause **continual sympathetic activation** with **very little opportunity for the parasympathetic to be activated**.
- *Parasympathetic activation allows the bowel and non-muscle organs to receive good blood-flow, the pupils constrict, and the glands all function well and secrete their various compounds.*
- **Absence of parasympathetic** activation leads to **poor digestion, poor healing and organ function**.
- The body reacts to stress by **releasing**:
 - 1- catecholamine (epinephrine and norepinephrin)
 - 2- Cortisol (glucocorticoids)
- The hypothalamic-pituitary-adrenal axis (HPA) balance hormones released from adrenal medulla and adrenal cortex.

Psychoneuroimmunology (PNI)

☞ PNI investigates the relation between the psychophysiological and immunophysiological of the man.

☞ It's also involve endocrinology and is sometimes referred as (psyco endoneuro immunology)

Stress can significantly affect many of the body's immune system. And it's thought to affect immune function through **emotional and/or behavioral manifestations** (such as anxiety, fear, tension, anger and sadness) and **physiological changes** (heart rate, blood pressure and sweating).

Stressful events trigger **cognitive and affective responses** which, in turn, induce **sympathetic** nervous system and **endocrine** changes, and these ultimately **impair immune function**.

Health **consequences** include rates of infection, HIV progression, and cancer incidence and progression.

These changes are beneficial if they are of limited duration, but when stress is chronic, the system is unable to maintain equilibrium or homeostasis.

*****Stressful events** (acute, short-term and long-term) in healthy adults revealed consistent **stress-related immune changes**:

- 1- INCREASE in numbers of total white blood cells
- 2- DECREASE in the numbers of Helper T cells, Suppressor T cells, cytotoxic T cells, B cells and NK cells.

*****Anti-depressants** seem to exert beneficial effect by (1) DECREASING interferon beta (IFN- β) release or (2) augmenting NK activity in depressed patients.

What are the determinants of GAS?

- overall health and nutritional status
- sex, age and genetic makeup
- ethnic or racial background
- level of education
- socioeconomic status SES

What is the pathological impact of stress?

- psychiatric disorders
- stress disorders
 - Acute stress disorder
 - Post traumatic stress disorder
 - Adjustment disorder
- Physical disorders (psychosomatic)

?How to reduce stress! **نيجي للأسئلة المهمة!**



Stress reduction strategies

There are three categories:

- 1- avoiding stressors
- 2- changing one's reaction to the stressor
- 3- relieving stress after the reaction to the stressor

There are many mainstream as well as complementary or alternative strategies for stress reduction, like:

- exercise
- listening to music
- massage

Selye approach to stress: (living wisely in accordance with natural laws)

- adopting an attitude of gratitude towards life
- acting toward others from altruistic motives (unselfish)
- retaining a capacity for wonder and delight and the genuinely good and beautiful things in life
- finding a purpose for one's life and expressing one's individuality in fulfilling that purpose
- keeping a healthy sense of modesty about one's goals or achievements

pastpapers:

- 1- Not a system affected by stress – cardiovascular system (maybe)
- 2- not usual cause of stress? having free time
- 3- all of the following are factors moderating stress responses except: a- novelty b- personality c- prior experiences d- social support e- ... (the answer)
- 4- all occur in stress except: lymphocyte proliferation