Stress

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Stress
(Psychological stress)

- **In medical terms:**

Stress is the disruption of homeostasis through physical or psychological stimuli.

- **Selye Definition:**

Body's physiological response to psychological and physical demands (stressors)

Stressors

- A **Stressor** is a stimulus or event that provokes a stress response in an organism.

- **Stressors can be categorized as:**

➢ Acute	X	Chronic
➢ External	X	Internal
➢ Unpleasant *(Distress)*	X	Pleasant *(Eustress)*
➢ Physical	X	Emotional *(Psychological; Mental)*

Common stressors

Both negative and positive stressors can lead to stress:

- **Sensory: pain, bright light**
- **Life events: birth and deaths, marriage, and divorce**
- **Responsibilities: lack of money, unemployment**
- **Work/study: exams, project deadlines**
- **Personal relationships: conflict, deception**
- **Lifestyle: heavy drinking, insufficient sleep**
- **Early life exposure (e.g. child abuse)**
- **Lack of control over environmental circumstances, such as food, housing, health, freedom, or mobility.**

Psychological Distress

Results from three types of experience:

1. **Pressure**
2. **Conflict**
3. **Frustration**

Special Stressful Events

- Serious Physical Illness
- Terminal Illness
- Bereavement

Components of the Stress Response

1. **Emotional** (Fear, Anxiety and Depression) accompanied by somatic changes

2. **Psychological** to reduce the potential impact of the experience:

- ✓ Impaired recall and numbness
- ✓ Coping strategies
- ✓ Defense Mechanisms

Coping Strategies

1. **Adaptive:**
   - Avoidance
   - Working through problems
   - Coming to terms with situations
2. **Maladaptive:**
   - Substance abuse
   - Histrionic or aggressive behavior
   - Deliberate self-harm
3. **Culturally determined**

Individual's Response to Stressors

Determined according to:

1. **Physiological reactivity**
2. **Cognitive appraisal**
3. **Control**

- ✓ **Type A behavior**
- ✓ **Hostility**
- ✓ **Antagonism with others**

STRESS SYMPTOMS

- Unusual heart beat (fast, pounding, irregular, etc.)
- Unusual breathing (fast, shallow)
- Restless feeling (feels like you have to move)
- Muscles feel tight or tens
- Frequent aches and pains
- Headaches
- Often get the flu or cold

STRESS SYMPTOMS

- Feels warm or hot when it isn't hot
- Sweat more than normal
- Dry mouth
- Nervous stomach (gas, diarrhea, constipation)
- Heartburn, Nausea,
- Loss/or increase in appetite
- Urinate more than normal
- Fatigue

STRESS SYMPTOMS

- Obsessive worrying
- Lack of concentration
- Memory loss
- Feeling self-consciousness, Shy, 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.

- GAS involved two major systems of the body:
  - the nervous system
  - the endocrine (or hormonal) system.

- Three distinctive stages:
  - Alarm reaction
  - Resistance
  - Exhaustion

Stage 1: Alarm reaction

- is the immediate reaction to a stressor.

"fight or flight" response, which prepares the body for physical activity.

- This initial response can also decrease the effectiveness of the immune system, making persons more susceptible to illness during this phase.

Stage 2: Resistance (stage of adaptation)

- During this phase, if the stress continues, the body adapts to the stressors.
- Changes at many levels take place in order to reduce the effect of the stressor.

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

Stage 3: Exhaustion

When stress continued for some time the body's resistance to the stress may gradually be reduced.

- The immune system, and the body's ability to resist disease, may be almost totally eliminated.
- Patients may develop heart attacks or severe infection due to their reduced immunity.

Example, a person with a stressful job may experience long-term stress that might lead to high blood pressure and an eventual heart attack.

Neurochemistry and Physiology of GAS

- **Stress activates the sympathetic division of the ANS and release of epinephrine, and cortisol.**
- **Sympathetic output produces the fight-or-flight response, causing the body to divert blood flow to large muscles.**
- **Less blood flows to the digestive system and other organs, producing dry mouth, motor agitation, sweating, pallor, enlarged pupils and, insomnia.**

Neurochemistry and Physiology of GAS

- **Stressors can cause continual sympathetic activation with very little opportunity for the parasympathetic to activate.**
- **parasympathetic activation allows the bowel and other non-muscle organs receive good blood-flow, the pupils constrict, and the glands all function well and secrete their various compounds.**
- **Absence parasympathetic activation leads to poor digestion and may lead to poor healing and organ function.**

Neurochemistry and Physiology of GAS

- The body reacts to stress first by releasing:
  - catecholamine hormones (epinephrine and norepinephrine)
  - glucocorticoid hormones (cortisol).
- The hypothalamic-pituitary-adrenal axis (HPA) balances hormone releases from the adrenal medulla, and from the adrenal cortex.

Psychoneuroimmunology (PNI)

- PNI investigates the relations between the psychophysiological and immunophysiological dimensions of Man.
- PNI also involves endocrinology and is sometimes referred as: psycho endoneuro immunology (PENI).
- **Stress can significantly affect many of the body's immune systems.**
- **Stress is 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. Sweating).**

Psychoneuroimmunology (PNI)

- **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**

Psychoneuroimmunology (PNI)

- **Stressful events (Acute, Short-term and Long-term) in healthy adults revealed consistent stress-related immune changes:**
  - **Increases in numbers of total white blood cells**
  - **Decreases in the numbers of helper T cells, suppressor T cells, and cytotoxic T cells, B cells, and Natural killer cells (NK)**
- **Antidepressants seem to exert beneficial effects by decreasing Interferon-beta (IFN-beta) release or augmenting NK activity in depressed patients.**

Determinants of GAS

- overall health and nutritional status,
- sex,
- age,
- ethnic or racial background,
- level of education,
- socioeconomic status (SES),
- genetic make up,
- others….

Pathological Impact of Stress

1. **Psychiatric disorders:**
2. **Stress disorders:**
   - Acute Stress disorder
   - Post traumatic stress disorder
   - Adjustment disorder
3. **Physical disorder (Psychosomatic disorders)**

Stress reduction strategies

- ❖ Generally fall into one of three categories:
- avoiding stressors
- changing one's reaction to the stressor
- relieving stress after the reaction to the stressor
- ❖ Many mainstream as well as complementary or alternative strategies for stress reduction:
- exercising
- listening to music,
- massage

Selye Approach to Stress

(living wisely in accordance with natural laws)

- Adopting an attitude of gratitude toward life.
- Acting toward others from altruistic motives.
- Retaining a capacity for wonder and delight in 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.

THANK YOU