IMPACT OF STRESS ON HEALTH

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Stress and Disease: Stress, a universal phenomenon, is considered to be a condition in which people respond physically, psychologically and socially to life changes. "Hans Selye identified stress as a nonspecific response of the body to any demand made on it. Stress, on its own, does not make you ill; it may increase risk or vulnerability to illness". Thus, play a vital role in the etiology of diseases.

A threat to one's life safety is considered stressful and triggers primary physical response by the body. From deep within the brain, a chemical signal speeds stress hormones through the blood stream, priming the body to be alert and ready to escape danger. Concentration becomes more focused, reaction time faster and strength and agility increase. When the stressful situation ends, hormonal signals switch off the stress response and body returns to normal.

In modern society, fraught with stressful daily events, hassles, and relationships, and contingent on individual's hormonal response, stress does not always let up. The stress hormones continue wash through the system at high levels, never leaving blood and tissues. Research shows that long term activation of stress system can have a hazardous and even lethal effect on the body.

People who only see negative aspects of stressor may be more vulnerable to stress than those who make more positive appraisal of the situation; and those who are less vulnerable to stress have personalities that act as buffers. These individuals generally have more positive out looks on life.The factors that mediate stress and disease are Hardiness, Sense of coherence, Resilience, Attitude these factors also buffer stress, hence people with these are more likely to cope with life stressors.

Stress effects biological system of the body (ex: physical strain, hormonal changes) increase maladaptive coping behavior (ex: smoking, alcohol; effect emotions) which effects on diet and activity levels, all of them contribute to increased risk of disease.Current research has indicated that between 70 to 80 percent of health-related problems may be precipitated or aggravated by stress.

To understand the relationship between stress and disease, one needs to understand that several factors act in unison to create a pathological outcome; Cognitive perceptions of a threatening stimulus, Activation of the sympathetic nervous system, Engagement of the endocrine system and Engagement of the immune system.

Dr. Gabor mate in 2003 theorized in his treatise when body says no: understanding the stress – disease connection that repressed stressful emotions can interfere with psycho-neuro-immune axis and predispose a person to a variety of diseases.This term was coined by Robert Ader around 1980 to explain the integrative dynamics of mind and body**.** Pelletier defines psycho-neuroimmunology as the study of the intricate interaction of consciousness (psycho), brain and central nervous system (neuro), and body's defense against external infection and internal aberrant cell division (immunology).

Influence of stress in Disease Causation

Stress and Cardio Vascular Diseases:

❖ An impaired ability to physiological and psychological stress may contribute to the pathogenesis of cardiovascular disease.

❖ The sympathetic nervous system regulates abroad range of visceral functions and during extreme emotional or physical states, activities both cardiovascular and adrenal catecholamine systems for homeostatic adjustments

Stress and Gastro Intestinal Diseases:

❖ We all talk about "gut feelings," but few of us really appreciate the amazingly strong connections between

the brain and the digestive system.

❖ The stomach and intestines actually have more nerve cells than the entire spinal cord, leading some experts to call the digestive system a "mini brain."

❖ A highway of nerves runs directly from the real brain to the digestive system, and messages flow in two directions.

❖ Consider this: 95 percent of the body's serotonin - a hormone that helps control mood is found in the digestive system, not the brain.

❖ When the brain feels severely stressed, it unleashes a cascade of hormones that can put the whole digestive system in an uproar.

❖ The hormones have different and sometimes contradictory jobs. For example, the hormone CRH (corticotropin-releasing hormone) is one of the body's main alarm bells.

❖ In stressful situations, the brain pumps out CRH to tell the adrenal gland to start making steroids and adrenaline, chemicals that can give you the strength and energy to run or fight your way out of trouble.

❖ CRH also turns off appetite, which explains why some people can't eat anything when they're stressed. At the same time, the steroids triggered by CRH can make a person hungry, that's why some people fight stress with ice cream, chocolate, or potato chips.

❖ stress can cause stomach aches, nausea, and diarrhea. In the long term, prolonged stress can aggravate chronic diseases such as Irritable bowel syndrome , Heartburn, Gastric ulcers ,Ulcerative colitis and crohn's disease

Stress and wound healing:

☞ Wound healing is a critical process involved in the recovery from injury and surgical procedures.

☞ Poor healing increases the risk for wound infections or complications, lengthens hospital stays, magnifies patient discomfort, and slows down to return to activities of daily living.

☞ Converging evidence from different research paradigms suggest that psychological stress and other behavioral factors can affect wound healing.

☞ Psychological stress leads to the activation of the hypothalamic-pituitary-adrenal and the sympathetic-adrenal-medullary axis .

☞ Enhanced glucocorticoids and catecholamine's production can directly influence several components of the healing process and can retard the initial inflammatory phase of wound healing.

Stress and Immune Diseases:

☞ On prolonged stress individuals immune system and the Inflammatory response stays "on" by secreting Pro inflammatory cytokines which maintain long term systemic inflammatory responses.

Eg Inflammatory Bowel Disease - Crohn's disease, Rheumatoid arthritis , liver and kidney fibrosis, COPD,Heart disease / atherosclerosis ,Some Cancer,Alzheimer's Disease;

❖ Long term and long past stress might result in too low levels of cortisol and increases inflammation.

Stress and Accident proneness:

Adjustment stress theory sets forth the conditions under which a worker increases their ability to accidents or other low quality behaviors'. Environmental stressors can be internal (drugs, alcohol) or external (excess strain, noise) may predispose to accident proneness.

❖ Some of the causes for accidents are Accident proneness (Personal factors), Goals-Freedom-Alertness (management should let a worker have a well-defined goal and should give the worker the freedom to pursue that goal), Adjustment-Stress (safe performance is compromised by a climate that diverts the attention of workers) Chain of events, Distractions

❖ Researchers stated that accidents could be due to personality traits. Some theories suggest that safe work performance is a result of a psychologically rewarding work environment.

Stress and cancer:

❖ The correlation between cancer and stressful life has recently been investigated. A significant association exists between shifts and stressful jobs, trauma, grief on the one hand and incidence of malignancy on the other hand.

❖ Cancer and stress are both characterized by a huge complexity, heterogeneity and multifactorial pathogenesis

❖ Stress induced diseases mostly depend on increasing of catecholamine, cortisol, neurotransmitters, hormones and impairing of immune system. All these mediators also impact on metastatic spread, Immune system, mechanisms of DNA repair.

❖ However stressed individuals are more likely to have cancer than stress-free individuals because they smoke tobacco, consume excessive amounts of alcohol, and be obese, all these behaviors are risk factors for cancer and are associated with chronic inflammation.

❖ A role for inflammation in tumorigenesis is now generally accepted: an inflammatory micro environment is an essential component of all tumors, including some in which a direct causal relationship with inflammation is not yet proven.

❖ Research provided evidence for links between chronic stress, depression, social isolation and cancer progression.

❖ Cellular and molecular studies have identifies specific stress induced signaling pathways that impact on cancer growth and metastasis.

Stress and Endocrine System:

❖ In response to stress, the level of various hormones changes.

❖ Reactions to stress are associated with enhanced secretion of a number of hormones including Glucocorticoids, Catecholamine's, Growth hormone, Prolactin, Gonadotropins, Thyroid Hormones, Insulin. Excessive secretion of all these hormones imbalances the metabolisms in the body.

Stress and Musculoskeletal Disease:

❖ When the body is stressed, muscles tense up. Muscle tension is almost a reflex reaction to stress. When muscles are taut and tense for long periods of time, this may trigger other reactions of the body and even promote stress-related disorders. For example, both tension-type headache and migraine headache are associated with chronic muscle tension in the area of the shoulders, neck and head.

❖ The research reveals that the people with muscular disorders show high cortisol levels in the blood when compared to healthy adults. The elevated levels of cortisol during stress havoc on our system. The body in response, to balance our system releases calcium from bones and teeth.This calcium helps to neutralize the pH balance of the cortisol that depletes calcium from our body.In chronic stress our bones are constantly being leached of calcium leading to porous and brittle bones in turn cause osteoporosis.Cortisol along with pro inflammatory cytokines (TNF and interleukins) causes rheumatoid arthritis.

Stress and Respiratory diseases:

❖ Stress can make you breathe harder. That's not a problem for most people, but for those with asthma or a lung disease such as emphysema,getting the oxygen you need to breathe easier can be difficult.

❖ Some studies show that an acute stress - such as the death of a loved one can actually trigger asthma attacks, in which the airway between the nose and the lungs constricts.

❖ In addition, stress can cause the rapid breathing - or hyperventilation that can bring on a panic attack

❖ Stress alters respiratory physiology among emotionally disturbed like rate, rhythm of respirations and volume of air per breath and changes in the alteration of alveolar carbon dioxide.

❖ Stress increases the production of pro-inflammatory cytokines as a inflammatory response. These factors contribute to various respiratory disorders like Asthma, COPD, respiratory infections like tuberculosis, psychogenic stridor, lung cancer, functional dysphonia and psychogenic cough.

Stress and Neurological disorders:

❖ When the body is stressed, the SNS generates what is known as the "fight or flight" response. The body shifts all of its energy resources toward fighting off a life threat, or fleeing from an enemy.

❖ The SNS signals the adrenal glands to release hormones called adrenalin and cortisol.

❖ Continuous stress activates the nervous system and increases the risk for stroke.

❖ Increased levels of vasopressin and aldosterone cause the blood to become stickier and release of LDL which causes occlusion of the blood vessel and atherosclerosis.

❖ Cytokines accumulates as plaques in the brain tissue causing Alzehmeirs disease.

Stress and male and female reproductive Disorders:

❖ Stress causes the body to release the hormone cortisol, which is produced by the adrenal glands. Cortisol is important in regulating blood pressure and the normal functioning of several body systems including cardiovascular, circulatory and male reproduction. Excess amounts of cortisol can affect the normal biochemical functioning of the male reproductive system.

❖ Chronic stress or ongoing stress over an extended period of time, can affect testosterone production, sperm production and maturation, and even cause erectile dysfunction or impotence. Also, when stress affects the immune system, the body can become vulnerable to infection. In the male anatomy, infections to the testes, prostate gland aurethra, can affect normal male reproductive functioning. Where as in females it cause Menstruatral disorders,Premenstrual Syndrome (PMS), EarlyMenopause, decreaed Sexual Desire.

Stress and skin disease:

❖ In early 80's when Cermak and Panconesi described the connection between "psyche and skin diseases' Skin responds to different types of stressful stimuli and psychological states.

❖ Stress intervenes through the hypothalamic-pituitary-adrenal (HPA) axis with the release of neuro mediators from the nerve endings and dermal cells (neuropeptides, neurotrophins, lymphokines).There are connections between endocrine-nervous and immune system. Stress has been reported to cause decreased natural killer cell cytotoxicity, depressed mitogenic responses in lymphocytes, increased IGA levels, enhanced neutrophil phagocytosis activation of interferon Synthesis lymphocytes.

❖ Corticotropin-releasing hormone (CRH) coordinates the systemic stress response via the role of stressful events like break down of collagen and cause inflammation that results in psoriasis, alopecia, atopic dermatitis and Utricaria seems to be apparently clearer.

Role of nurse in Stress Induced Diseases: Nurse emphasizes on the following measures to master stress to prevent the occurrence of diseases.

Change lifestyle habits:

❖Decrease caffeine.
❖Well-balanced diet.
❖Decrease consumption of junk food.
❖Eat slowly.
❖Regular exercise (at least 30 minutes, three times per week).
❖Adequate sleep (figure out what you need, and then get it).
❖Leisure time (do something for yourself everyday).
❖ Relaxation exercises (e.g., meditation, self-hypnosis).

Change stressful situations:

❖Time and money management.
❖Assertiveness.
❖Problem-solving.
❖Possibly leaving a job or a relationship.

Change your thinking:

❖Look at things more positively.
❖See problems as opportunities.
❖Refute negative thoughts.
❖Keep a sense of humor.

Diversion and distraction: Take a time-out (awalk to a vacation) to get away from the things that are bothering you. This will not resolve the problem, but it gives you a break and a chance for your stress levels to decrease. Then, you can return to deal with issues feeling more rested and in a better frame of mind.

Conclusion: The Dual Nature of Stress and Negative ramifications upon the health and well being of all individuals makes stress difficult to ignore. The key health care issue such as chronic disease which alters the quality of life results from potential impairment of stress response system due to continuous exposure to chronic stress. With early intervention and remediation of the stress there is potential to reverse or halt negative changes on body systems. Treatments or management that addresses stress in people's lives can potentially help to reduce or reverse the impact of stress on the body system.

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