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Research Paper

Harmful effects of stress on human physiology

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Abstract: In the routine way of life, everybody faces stress. These are natural reactions, which may be inherent or external incentives in daily life in the form of mental pressure. In the human body, stress causes very harmful effects. Due to excessive stress, a variety of diseases may occur, including cardiac problems, hypertension, inflammatory bowel syndrome, type-2 diabetes, and even cancer. The initial stage shows alarming signals to the body due to the overproduction of adrenaline. The second stage is a conflict condition, where the body puts up resistance and can easily handle the problem caused by stress. The last phase is more dangerous, the tiredness phase. Many experiments have clearly proven that stress affects different organs of the body and impacts human physiology. The chronic stage is very dangerous because it stimulates infection in the vasculature, particularly inside coronary arteries, alters cholesterol levels, and affects the sympathetic nervous system. Stress conditions can be managed by maintaining healthy and regular eating habits, including important supplements; moreover, physical exercise and mental rest through proper sleep are regularly suggested.

Keywords: Stress, Hypertension, Type-Two Diabetes, Acute and Chronic Stress, Cardiovascular System.

Introduction:

The term "stress" is a very common psychological problem in the routine life of human beings. Stress is referred to as a condition in which the mind responds through biochemical processes within the body. In such conditions, various external and internal factors are responsible, resulting in anxiety and depression in tense situations (Buzunay and Goswami, 2018). Depending on the timing and seriousness of the stress level, stress can exert different effects on the body, from disturbing homeostasis to causing very dangerous impacts on the human body (Yaribeygi *et. al*., 2020). Generally, it occurs when there is a lack of

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resources to meet the body's requirements, and many psychologists say that stress is an uninvited part of the human lifespan, experienced at every stage, even before birth. In light of various studies, the pathophysiological complications of diseases occur from stress. It has been proven that those who work or live in stressful environments have a higher risk of many disorders in comparison to people living in less stressful conditions (Glaser and Glaser, 2005).
Cortisol plays a very important role in mediating stress effects on memory. It helps explain why stress affects memory, though sometimes such effects are not observed in certain conditions (Stein and Miller, 1993). In daily life, it has been experimentally observed and proven that numerous hormones, peptides, and even neurotransmitters are released, which adversely affect health (Guenzel *et. al*., 2013).
Stress is a norm of life that may arise from the surrounding environment, the body, and thoughts. Stress can affect every person's physical fitness, thoughts, feelings, emotions, and behavior (Ranabir and Reetu, 2011). There are several causes of stress, such as health, work, relationships, family-related problems, and other situations. However, sometimes stress can be a positive source of energy and essential for survival. When facing challenges, humans react physically to protect themselves by activating the 'Fight or Flight' mode (Bracha *et. al*., 2004).
There are three types of stress: acute stress, episodic acute stress, and chronic stress. Acute stress is very common and short-term; it is caused by over thinking about the pressure of a situation or recent events, or upcoming situations that may occur in the future.

In most cases, once the situation is resolved, the stress is reduced or completely removed. The frequent occurrence of acute stress may lead to chronic stress, which is more harmful in comparison to acute stress. Episodic acute stress occurs in people who frequently experience acute stress. Chronic stress can be caused by a traumatic experience occurring early in life (Baum *et. al*., 1990). According to the National Scientific Council on the Developing Child, stress is classified into three categories: Positive Stress, Tolerable Stress, and Toxic Stress. Based on their research and other studies, positive stress results after undesirable but manageable events. This type of stress causes minimal functional changes, including variations in hormonal levels. With the support of gentle and calm adults, children can learn how to manage and overcome positive stress (Granath *et. al*., 2006).
Tolerable stress refers to adverse events that are more intense but comparatively short. If a suffering child has the support of a caring adult, tolerable stress can be overcome. Finally, toxic stress results from intense adverse experiences that may last for a prolonged period, weeks, months, or years, depending on the situation. There is much experimental evidence that stress can affect an individual's health not only through direct physiological processes but also by changing behaviors that negatively affect health (Zellner *et. al*., 2006).

Review of Literature:
Stress is a normal part of life. We often experience various types of stress from our environment, emotions, body, and thoughts (Minter, 1999). According to Pestongee (1992), stress is a "perceived dynamic state involving uncertainty about something important." Stress is categorized as acute

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and chronic stress. Chronic stress includes stress that is not short-term (Oxington, 2005). On the other hand, acute stress results from a reaction to a short-lived, urgent threat, which may be either real or perceived (Violanti, 1983). According to these researchers, stress can be caused by psychological, environmental, social, and biological factors. Stress also has negative effects on learning. Additionally, Adrenal steroids cause variations in long-term potentiation, which is a very important process in memory development (Dedovic *et. al*., 2009). Stress also affects the immune system. Under stress, the immune system's ability to fight off antigens is reduced. Moreover, stress is responsible for long-term problems related to the heart, blood pressure, and stroke (Steptoe and Kivimaki, 2012).

Effects on Human physiology:

Stress affects the human digestive system, central nervous system, cardiovascular system, and immune system. Some experiments have concluded that stress has many impacts on the human nervous system and causes mechanical changes in various parts of the brain. The central nervous system controls memory. The brain and adrenal glands are control centers that maintain body homeostasis. Anxiety starts in the mind and disturbs the cerebrum. In daily life, stress and the hyper-secretion of corticosteroids impose an increased risk for depression as well as increased abdominal obesity, cardiovascular problems, and osteoporosis (Zafar *et. al*., 2021). Cognition is an essential function of the human body. Cognition means the reception and perception of external stimuli and their analysis, which includes learning, decision-making, and the power of attention and judgment. Stress activates several physiological functions such as the autonomic nervous system, neuropeptide system, and hypothalamic-pituitary-adrenal axis, which affect neural control of the body. The immune system and endocrine system are closely related and linked with each other. Both systems are regulated by cell-mediated and hormonal responses. Stress affects the body's response and increases white blood cells in the blood. Due to stress, the main and minor reactions of the immune system are enhanced. The intensity of stress produces over-secretion of hormones and causes physiological changes in the body, such as increased heartbeat and blood pressure. Various hormonal changes arise in the body in response to stress. Psychological stress plays a very important role and is highly recognized as a causative factor in developing a higher risk of cardiovascular diseases. Stress stimulates the sympathetic nervous system, which increases vasoconstriction. Excessive stress contributes to cardiovascular diseases at many stages. It is experimentally proven that the cardiovascular system is severely affected by stress conditions. Stress also affects the gastrointestinal area. There are many studies proving that stress impacts the enteric nervous system, leading to gastroesophageal reflux disorder, peptic ulcer disease, inflammatory bowel disease, and dyspepsia.

Stress and their management:

(i) Diet Control

Stress is a very serious and continuous problem in daily routine life, but it can be managed and reduced with the help of some common stress management skills. Always eat a balanced and moderate diet. Refined carbohydrates always increase the blood sugar level. Due to high levels of blood sugar, stress and anxiety may also increase.

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Eating a healthy diet helps to overcome stress. Emotional stress affects all aspects of nutrition. A variety of nutritious diets is necessary, and the required nutrients should consist of natural sources of vitamins, proteins, and fatty acids. A healthy person requires approximately 40 to 55 nutrients per day. Vitamin B helps the body prevent stress, build metabolism, and control the entire nervous system. Proteins support tissue repair, growth, and development. Vitamin A is very important for vision, while Vitamin C protects the immune system, helps prevent diabetes, and reduces the quantity of hydrocortisone in the body. Magnesium is required for strength, and fatty acids are required for muscular development and heartbeat regulation.

(ii) **Stress and Yoga Practice**

The practice of Yoga in routine life is very important for the reduction of stress. Yoga unites bodily progress, gentle workouts, reflection, as well as self-controlled breathing, all of which are excellent for stress relief. Yoga offers a range of natural, spiritual, as well as emotional advantages.

(iii)Stress and Mindful Exercise

Physical activity is key to managing stress and improving mental health. It is generally accepted that exercise is beneficial for aging humans as well as patients with Parkinson's disease or Alzheimer's disease.

Conclusion:

"STRESS" is defined as a versatile reaction to an external circumstance that results in natural, physiological, psychological, and developmental variations in the body. Stress affects the whole body and various physiological activities such as the nervous system, gastrointestinal system, as well as reproductive and psychological functions. Psychological stress is highly recognized as an important issue and has the tendency to develop a higher risk for cardiovascular diseases. The initial impact of anxiety on heart function is usually an increased heart rate; the next effect is on blood pressure.

According to a survey, about 66% of people with anxiety and gastroesophageal disorders suffer from irritation and related effects caused by anxiety. Extra strength, oxygen consumption, and basic metabolic rate are some important co-factors that are necessary for the proper functioning of a stress-free body.

Yoga plays an important role in overall growth and development. Reflection and gentle workouts are required for proper inhalation. At last, it is concluded by various psychologists that mindful workouts are easy to adopt as well as marvelous for boosting resilience to stress.

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