

# Life Style Stress Altering Immunity Resulting In Poor Health

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**Abstract:** Although the direct casual relationship between immune response and nervous system is yet to be established, there are growing evidences that stress is indeed involved in weakening of immune response (immunosuppression) which further leads to poor health and affects individual's performance in various aspects of life. This brief review throws more light on the link between immune system and stress and helps in strengthening our knowledge regarding the association between the stressors, immune system and physical health.

## INTRODUCTION

What is the reason being deprived of happiness in life? If we try to find out the answer to this question, we have to first analyze our lifestyle. Life is not as complicated as we have made it by our thinking, deeds and lifestyle. A little bit of stress is an in built process that keeps our body and mind active but long term stress may lead to unhealthy habits such as smoking, eating a poor diet, drinking too much alcohol and not getting enough exercise - adding to the risk of developing health problems. Therefore, there is an urgent need to understand the causes of stress and learn to cope with it. Here an attempt is made to unravel the underlying physiological and psychological link between immune system and nervous system. This article defines the symptoms, causes and management strategies of lifestyle stresses and also touches upon the effect of long term stress on immune system of the body.

## WHAT IS STRESS –LIFE OR DEATH?

Stress is defined as body's response to any situation or demand. The stress causing situation or pressure is known as stressor. Although a certain level of stress is actually good for individual growth as a person, because it helps us in accelerating the magnitude and quality of efforts in achieving the desired goal. During stress, our endocrine system and nervous system orchestrates to combat the situation leading to the rise in pulse rate, building of tension in muscles and rise in blood pressure (commonly known as Flight-or-Fight response). All these body's

responses help to cope with the difficult situations. When these stress hormones continue to circulate in the bloodstream and perturbs the person's psychological homeostasis, it becomes detrimental to health. Long term stress can contribute to weak immunity, resulting in health problems such as depression, anxiety, heart disease, stroke and high blood pressure.

## WHAT ARE LIFESTYLE STRESSES AND HOW TO RECOGNIZE THEM?

Lifestyle stress is a common problem caused by unhealthy lifestyle, time mismanagement, disorganized work schedule and eating habits. People have different responses towards different situations. A situation or event which is very stressful for someone may not be as difficult for others. Some people are at high risk towards stress related physical problems. For example, people who drive them hard and are impatient are more prone to the psychological and physical disorders. Moreover, stressed individuals become more susceptible to various infection, cancer, high blood pressure, heart attack, stroke, autoimmunity disorders. The most common life stressors are bereavement, academic exams, marital strain and divorce, social isolation, work, mental traps and lifestyle behaviors. The symptoms of lifestyle stress may present symptoms such as irritability, anxiety, lack of concentration, confusion resulting in lack of decision making process, poor judgment, frustration, emotional withdrawal and anger. Suffering from lifestyle-related stress can also affect one's ability to meet deadlines, make decisions, and manage professional relationships

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at the academic and professional front.

## WHAT ARE THE FACTORS INFLUENCING THE STRESS SUSCEPTIBILITY?

A person's susceptibility to stress can be affected by many factors and may not be constant throughout his/her life. Childhood experiences, personality traits, emotional instability, genetics and lifestyle are some of the factors which determine the person's tolerance to stress.

## WHAT HAPPENS TO YOUR BODY WHEN YOU ARE STRESSED?

Our body has a well defined physiological mechanism to cope with stress. However, if these mechanisms are in activated state for a long time, it may result in to psychological disorders such as depression and anxiety. There are two types of stress responses which are:

- **Acute Stress Response:** The acute stress response is an immediate physiological response to a situation resulting in a stressful event. The body's immediate response in such situation is to release chemicals, called "stress hormones," which alters body's physiological process in positive loop to cope up with such stresses. These physiological processes mainly act at muscle and brain tissues, and certain cells of the immune system which in turn become more active.
- **Chronic Stress Response:** Chronic stress occurs when a person has continuous acute stress responses. Chronic stress results in more sustained changes in the body resulting in high blood pressure and weakening the immune system responses to various infections. This also changes the pathways for continuous increase in stress hormones, which result in suppression of the immune system's white blood cells, leading to an increased risk of infections.

## STRESS AND IMMUNE FUNCTION

### *How does stress affect immune response?*

Immune system is a kind of a "body fighting machine" that almost reflects the harmonics of the way we perceive our outer and inner environment. Internal factors such as stress have been implicated in causing a deficient immune system. It is now being recognized that psychological stress influences inflammatory responses which cause inflammation of various mucosal system and mood. There is increasing understanding that social and psychological stressors such as anxiety, social isolation or insecurity affect health. Depression, for

example, was the 4<sup>th</sup> leading contributor to the global burden of disease in 2000 and is projected to be in second place in 2020<sup>1</sup>.

Frequent activation of stress hormones in the case of chronic stresses results in weakening of the immune response. A study in the New England Journal of Medicine actually found that higher psychological stress levels resulted in a higher likelihood of catching the common cold<sup>2</sup>. The conclusion made in this regard is quite astonishing which details that stress is indeed directly associated with weak immunity in spite of the reason associated with are various such as, the season; alcohol use; quality of diet, exercise, and sleep; and levels of antibodies before exposure to the virus. In addition some people who have a chronic illness may find that the symptoms of their illness flare up under an overload of stress. Markers of immune function provide a useful window onto the study of psychosocial stress, as a key pathway through which stress influences health status is through suppression of immune function. A growing body of literature has documented the links between immunosuppression and a range of life stressors<sup>3</sup>.

Immune system is basically a well coordinated system which takes care of the body by killing the foreign pathogens and abnormal body cells. It comprises of leucocytes (white blood cells) which can be divided in to three classes: Lymphocytes, Monocytes and Granulocytes. Each type of cell performs its own function and orchestrates with each to kill pathogens. These various types of cells communicate with each other by certain chemical messengers called as cytokines. Lymphoid organs are parts of the immune system which are the functional site for antigen presentation, activation of B and T lymphocytes and polarization of cytokine responses<sup>4</sup>. These lymphoid organs are innervated by sympathetic division of autonomic nervous system<sup>5</sup>. Sympathetic nervous system (SNS) is part of the autonomic nervous system that acts as a control system functioning largely below the level of consciousness, and controls various vital physiological functions. It affects heart rate, digestion, respiration rate, salivation, perspiration, and diameter of the pupils. It is mainly responsible for inducing Flight-or-Fight response. Molecular pathways for neural-immune interaction are well defined<sup>6</sup> and their functional capacity is increasingly recognized<sup>7</sup>, but their physiological role remains unclear. Recent studies have shown that stressors can alter the lymph node neural structure resulting in changes in secretion of chemicals called "cytokines" profiling of the organ<sup>8</sup> and which in turn causes immune-suppression<sup>9</sup>. The suppression of



immune system cannot cope up with various communicable infections which attack our body and further results in poor health and performance.

This coordination between immune system and nervous system is under highly controlled homeostasis and balance<sup>12</sup>. Both physiological and psychological components are equally important to maintain this balance. Long term stress may perturb this homeostasis leading to the various psychological and physical disorders<sup>13</sup>.

## WHAT ARE THE IMPACTS OF STRESS ON OUR HEALTH AND INFECTION RATES?

Stress may influence body's immune response either through the involvement of the central nervous system (CNS) and immune system (nerves terminating in lymphoid organs), or through neuro-endocrine-immune pathways (release of hormones). It is important to remember that there are many factors involved in getting an infectious disease. The distraction of stress on the mind interferes with focus and concentration, which can contribute to poor health, absenteeism and even to higher infection rates. Having a positive attitude seems to correlate with an increased ability of the immune system in fighting diseases. Psychological stress is known to affect immune function that may assist in predicting infectious disease susceptibility, as reported in both humans and animals<sup>14</sup>. A UNC-Chapel Hill study, published in 2000, found that men with HIV progressed to AIDS faster if they had chronic stress in their lives<sup>15</sup>. For each increased stressful event, the risk for AIDS progression doubled in these patients. Other studies have linked chronic stress with tuberculosis, herpes simplex virus reactivation, shingles, ulcers (caused by infectious *Helicobacter pylori* bacteria) and other infectious diseases<sup>16,17</sup>. Some studies of vaccinations have shown a decrease in effectiveness in individuals with high chronic stress<sup>18</sup>.

## STRESS MANAGEMENT

### *What can be done to treat the stress?*

The best thing we can do to maintain the stress free life is to adopt positive attitude and access psychological first aid. The stressed patient needs continual positive reinforcement to improve their self-confidence. In the long-term, behavioral therapy or medication might be beneficial based on the individual.

### *What can be done to minimize the stress?*

No doubt, stress is an integral part of life. The key of

managing stress in life is to be able to recognize stressors and understand whether they come from an outside sources or whether they are self provoked. Effective stress management is a lifestyle and we must learn to incorporate into our daily lives. A commitment to live a healthier lifestyle should never take a back seat, especially not to stress. Stress management is not only an urgent need in today's fast-paced lifestyle, but an important factor in both physical and mental health. The purpose of stress management is to help in recognition of root causes of stress in life and find ways of managing the pressures without compromising with health.

- **Sharing the feelings:** Suppressing of emotions could be a stress factor which could affect our health. This in fact results in lowering the response of our immune system. It has been observed that individuals who disclosed and share a tragic event seemed to have a better immunity in terms of immune response and generally are healthier than those who inhibit expression of such emotions. There is considerable evidence in the literature that discussing about such problems improves the immunity in terms of fighting with day to day infections and has better health, self confidence, and mental health<sup>19</sup>.
- **Be Clear On Priorities:** People become overscheduled because they add activities to their schedules for the wrong reasons, and end up spending their days doing things that don't reflect their values and priorities. Then they find themselves struggling to fit in what's important to them. Necessities like adequate sleep and other healthy habits fall by the wayside. Therefore, it's important to set up the priorities and move accordingly.
- **Time-management and organization skills** are crucial for fighting stress and are not often taught in the schools. This is most important aspect which should be taught especially when kids are in their formative phase. Help your kids stay on track after school and at night, allowing short breaks but no TV until the work is finished. Provide your child with a planner to schedule assignments; create a quiet space to study free of distractions; bump up homework to after school rather than after dinner.
- **Lifestyle stress in children:** Inferiority complex, superiority complex, identity crisis and depression play an important role in bringing negativity in children. Most of these aspects are consciously or inadvertently thrust on children by adults. The rising influence of media influences children watching TV serials and fashion shows with skinny models, to live on adult levels prematurely. It is imperative that



parents, elders or guardians recognize these stress symptoms and address the stressful situation so that the child gets to lead a normal, happy life.

- **Nutrition**: Diet is an influential and very important constituent of health factor that determines one's ability to function mentally and physically. We must ensure that a balanced amount of nutrients having diverse types of foods should be taken to keep our bodily functions in proper order. Food selection during early school years has an impact in people's future eating habits and overall performance. Thus, it is important for kids to learn how to get proper nutrition to keep their cognitive performance at its peak once they embark into the stressful life.
- **Sleep** is a natural way to recharge the tired body. Research revealed that sleep deprivation can cause drowsiness during the day. Sleep is an important physiological process where most of the organ's regeneration and growth takes place. Especially children who don't sleep well cannot perform well because of lack of concentration and thinking process. This prevents them from being productive. Since the physical state is intertwined with mental well-being, sleep-deprived students tend to suffer from poor mental performance as well.

## SUMMARY

In summary, developing the ability to learn from your mistakes is one of life's most important skills. When facing potential stressors, the way we view what we're experiencing can accelerate our stress. What one needs is to handle the stresses by seeking the help of psychologist-recommended methods for looking at things in ways that may result in feeling of less stress and also encourage a greater sense of self control with peace. Reversing negative ideas and learning to focus on positive outcomes helps in reducing stress and improves performance.

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