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Effects of Yoga on the Immune System

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ABSTRACT
Yoga is an ancient mind–body practice that is increasingly recognized to have health benefits in a variety of clinical and non-clinical conditions. Yoga have immunomodifier potential hence yoga is the best therapy in stimulating immune system, the present study is a systematic review conducted to examine the potential of yoga as immune modifier and its application in clinical advantages, practicing yoga is the best therapy for stress management, boosting immune cells like T- lymphocytes, also in treatment of psychological disorders and other diseases like Diabetes etc. various studies have been conducted to examine the effects of yoga on immune system functioning which is imperative to justify its application in the clinic. These results imply that yoga may be implemented as a complementary intervention for populations at risk or already suffering from stress or other immunological disorders. Beyond this, yoga practice may exert further beneficial effects by enhancing cell-mediated and mucosal immunity.

Keyword: Yoga, Immune System**,** Immunological disorders**,** Lymphocytes

I. INTRODUCTION

The word 'Yoga' is derived from the Sanskrit root 'Yuj', meaning 'to join'. Yoga is a concept of unity. Yoga harmonizes the body with the mind and breath through the method of various breathing exercises(pranayama), yoga posture(asanas) and meditation. Yoga may have been a group of physical, mental, and spiritual practices or practices that originated in ancient India. Yoga is, in fact, a spiritual discipline based on a very subtle science, focused on the connection between mind and body. It is the art and science of living a healthy life. According to Yogic texts the practice of Yoga leads to the fusion of individual consciousness with that of Universal Consciousness, which reflects the perfect harmony between mind and body, Man and Nature. The ancient definitions of yoga that have been studied for thousands of years in different traditions of yoga, different types of yoga and this will open up a little different understanding about yoga to us.

IMMUNE SYSTEM

Immune system is a complex network of cells, tissues, and organs. Together they help the body fight infections and other diseases. When pathogens such as bacteria or viruses invade our body, they attack and multiply. This is called infection. Infection causes a disease that makes us sick. Our immune system protects us from the disease by fighting with the germs. The main components of the immune system are: white blood cells, antibodies, lymphatic system, spleen, thymus and bone marrow. These are the parts of our immune system that fight against infection.

HOW IMMUNE RESPONSE WORKS

The immune system needs to be able to tell itself to differentiate from the others. It does this by detecting proteins found on the surface of all cells. It learns to ignore its own or self-protein at an early stage. An antigen is anything that can trigger an immune response.

In most cases, an antigen is a fungus, a virus, bacterium, toxins or an alien body. But it can also be one of our own cells which is faulty or dead cells. Initially, a series of cell types work together to identify the antigen as an invader.

Role of B lymphocytes

- When B lymphocytes detect an antigen, they begin to release antibodies (antigen is shortened by "antibody generators"). Antibodies are special proteins that attach to certain antigens.
- Each B cell produces one specific antibody. For example, one person may make an antibody against the bacteria that causes pneumonia, while another recognizes it as a common cold virus.

Antibodies are part of a large family of chemicals called immunoglobulins, which play a key role in the immune's response:

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- ❖ Immunoglobulin G (IgG) - It marks the pathogens so that other cells can detect and deal with them.
- ❖ Immunoglobulin M (IgM) - It is specialized in killing the bacteria.
- ❖ Immunoglobulin A (IgA) - It binds to fluids, such as tears and saliva, which protects the gateways that enter the body.
- ❖ Immunoglobulin E (IgE) – It protects against parasites and it is also be blamed for allergies.
- ❖ Immunoglobulin D (IgD) – It is always bound to B lymphocytes, helping them to trigger an immune response.

Antibodies lock the antigen, but do not kill it, marking it as death only. Killing is the function of other cells, such as phagocytes.

Role of T lymphocytes

There are different types of T lymphocytes:

- T Helper cells- They link the immune's response. Some interact with other cells, while others stimulate B cells to produce more antibodies. Others attract more T cells or phagocytes that feed on cells.
- Killer T cells (cytotoxic T lymphocytes) - As the name depicts, these T cells attack other cells. They are specifically useful in fighting pathogens. They work by identifying small parts of the virus without infected cells and destroying infected cells.

Fever is an immune system response

Rise in the body temperature's level, or fever, can occur with certain infections. This is a response of the immune system. Rising temperatures can kill certain germs. Fever also causes the body to repair itself.

How the immune system functions: -

Our immune system protects our body against things that it considers foreign or dangerous. These substances are called antigens. They can be pathogens such as bacteria and viruses. It can be chemical or toxin. They can be also be the cells that are devasted from the things like cancer or sunburn.

When your immune system detects an antigen, it attacks it. This is called immune response. Part of this response is to make antibodies. Antibodies are protein that serve to attack, weaken, and destroy antigens. Our body forms other cells to fight the antigen.

After that, our immune system remembers the antigen. If it sees the antigen again it can detect it. It will immediately send the right antibodies, so in most cases, we do not get sick. This protection against certain diseases is called immunity.

YOGA HELP US TO BOOST OUR IMMUNE SYSTEM

Researchers find out that yoga bring down the perilous effects of chronic inflammation.

Psychological stress can affect many systems in the body, including a weakened immune system and increased chronic inflammation. Inflammation is a natural part of the immune response, as well as a short-term benefit to the healing process of wounds, injuries, and infections, but chronic infection that can do more harm than good.

The researchers have conjointly examined the 15 randomized controlled trials that examined whether regular yoga practice can boost the immune system and reduces chronic inflammation. The average size of the sample in this study were 70 people, and the sample size ranged from 11 to 140 participants. Most of the studies have made use of a hatha yoga.

Scientists in these study trials examined the immune system response by measuring blood or saliva levels of circulating pro-inflammatory markers such as cytokines, a protein called C-reactive protein (CRP), as well as immune cell counts, antibodies, and markers of gene expression in immune cells. Researchers have found a complete pattern that yoga reduces symptoms of inflammation, and the strongest evidence for cytokine production is IL-1beta. There are mixed but promising results in terms of other types of markers that work with inflammation. One study found that yoga increased levels of anti-inflammatory cytokines such as IL-10. Other experiments have found that yoga can mediate inflammation at the genomic level, altering the levels of proteins that regulate the DNA sequence of the inflammatory cytokine gene. (Falkenberg RI, Eising C, & Peters ML. (2018)

According to various medical researchers, it is estimated that up to 90 percent of all illnesses are caused by stress, which is related to stress. Chronic stress can lead to the body producing high levels of continuous cortisol that works to suppress the immune system. Recent research has shown that a yoga session reduces the level of this stress hormone in the blood. After practicing yoga with an emphasis on long, deep breathing and relaxation knowing we feel comforted and calm. Some studies have shown that just 20 minutes of meditation a day not only lowers cortisol levels but also raises the levels of endorphins that stimulate mood-related emotions and mood swings.

Practicing yoga with its twisting, stretching, squeezing and tightening causes massage and brings new blood supply to the body's

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immune system such as the spleen and thymus. It makes support systems such as the circulatory system, the muscular system and the digestive system more efficient in providing nutrients and transporting waste.

The immune system uses the lymph nodes to fight off invaders and the lymph channels carry toxins into the bloodstream for disposal. Exercise and stretching the lymph propels, and there are also strong muscles that promote continuous lymph movement. Lymphatic fluid usually circulates throughout the body once a day but with exercise the flow can increase three or more times, depending on how difficult it is to exercise. The dynamic flow similar to the Salute to the Sun series therefore has a positive effect on the lymphatic flow within the body, increasing its circulation and thus being able to remove waste and open white blood cells and transport them to problem areas.

While yoga has strong support for physical healing methods, it is important to view yoga as a supplement or complementary therapy, and do not rely on it as the only cure for a chronic illness. (Australian School of Meditation & Yoga 2021).

II. DISCUSSION

Immune system is actually very complex and complicated. It's a system within the body that is designed to allow us to resist disease bacterial functions and viruses but it's also sensitive to helping us deal with other foreign substances and particles many of the components of the immune system are actually in the blood. Molecular entities that circulate in the blood. There're also organs that have immune functionality such as the thymus gland. How people experience different levels of immune functionality. So, it can be weak or can be strong and the changes that dictate that can be due to both physical, physiological or psychological factors.

On the physical level an existing disease or challenge to the body can weaken immune functioning. So, if we are under hypothermia or hyperthermia that's a challenge to the body that can a weaken our immune functioning. Other physical stressors include things like poor diet, poor sleep, smoking, and even alcohol consumption.

There's very nice research now showing that people who sleep deprived themselves are actually weakening their immune functioning response. There's a very strong effect of mental state on immune functioning. Which is led to the development of a whole field of research called psychoneuroimmunology. Which is really the effects of mental state and psychology on immune functioning and this is truly a mind body field of research. Perhaps the most important characteristic of this field is the finding that both acute and chronic stress can impact immune function. Now over the short-term stress actually can enhance immune functioning. If we have a challenge in life, we get a cut that short term stress enhances immune function allows us to cope with the potential virus or bacteria that might infect that region. However, the most common problem that we are dealing with is chronic stress which chronically impairs immune function and that is the bigger problem and we can actually see these things damaging the body or reducing immune function at the molecular and cellular level. The positive benefits of yoga therapies are achieved partly by reducing inflammation and improving various immunological parameters of immune response.

The benefit of yoga perhaps the most notable benefit of yoga is its ability to help people cope and regulate stress both physically and physiologically and mentally and this reduction in stress is immediately correlated with an improvement in immune function. So there's a direct relation ship for example people with life threatening diseases such as AIDS and cancer. Yogi's been shown to improve a number of metrics of immune functionality. Another feature of yoga is the overall improvement in mind body functioning. So, that optimization of human functionality also applies to immune functioning. For example, yoga practitioners typically also adopt healthy behavior such as proper diet and hydration and avoid unhealthy behavior such as assess of alcohol consumption and smoking and that comes in directly from the mind body awareness. That's inculcated through the meditative aspect of yoga. People can become more mindful of positive and negative influences and then gravitate towards positive behaviors and influences, and away from negative behaviors and influences. Yoga has been used for centuries in keeping the body functioning fit and fine, holistically. However, the benefits of yoga are not just limited to stress relief and mental wellness. If practiced properly, yoga can recharge our body, get rid of the toxins, negative energy and keep our vital organs functioning well. It can help us to build resilience both inside and out. Certain yoga positions can help support, balance and boost the immune system. It can also help fight oxidative stress which poses a risk to the healthy cells. If done regularly, yoga reduces stress systemically in the body, which in turn, cuts down inflammation and degeneration.

III. CONCLUSION

Yoga seems to improve some aspects of immune system function. As a yoga practitioner we are aware of the fact that by practicing yoga it feels refreshing. If we had not, we probably would not be so vivacious about our practice. It's invigorating that modern science is assimilating some information about why we feel more enthusiastic when we are maintaining a yoga practice. This systematic review of study summarizes the smaller clinical studies that suggests that different yogic practices improved the immune system. However, further research is still required in order to determine how many months or years of yoga practice are necessary to experience the benefits. However, it may take several years of yoga practice to see these effects consistently.

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