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Stress-Countering Through Yoga Nidra

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Abstract: Stress is normal biological reaction to a potentially dangerous situation. It is normal part of life. It produces numerous physical and mental symptoms which vary according to person's capability of handling it. It is linked to six of the leading causes of death: heart disease, cancer, lung ailments, accidents, cirrhosis of liver, and suicide. It is also linked to compulsive use of substances or behaviors to try to relieve their stress. These substances or behaviors include food, alcohol, tobacco, drugs, gambling, sex, and the internet. The process of stress management is named as one of the keys to a happy and successful life in modern society. This paper attempts to discuss the patho- physiology, measurement, and management of stress with special emphasis on yoga nidra.
Keywords: Fight or flight Response; Hypothalamus; Psychosomatic diseases; Adrenal gland; Cortisol; Yoga nidra.

INTRODUCTION

Stress is the body's reaction to any change that requires an adjustment or response. The body reacts to these changes with physical, mental, and emotional responses. One can experience stress from environment, body, and thoughts. Even positive life changes such as promotion, a marriage, or birth of a child produces stress.

Every one experiences stress from time to time. Anything from everyday responsibilities such as a new diagnosis, enmity, death of a loved one can trigger stress.

For immediate short term situations, stress can be beneficial. It can help to cope with potentially serious situations. Stress can be positive, keeping us alert, motivated and ready to avoid danger.

Stress becomes negative when a person faces continuous challenges without relief or relaxation. As a result, the person becomes overworked and stress related tension builds.

Stress is the aspect of modern life, modern civilization. Life has become so complex, hypnotizing and confusing for many people today that they find it very difficult to slow down, relax, and unwind when they get opportunity.

Autonomic Nervous System and Stress

The body's autonomic nervous system has a built in stress response that causes physiological changes to allow the body to combat stressful situations. This response is also known as "Fight or Flight Response". However this response can become chronically activated during prolonged periods of stress. Prolonged activation of stress response causes wear and tear of the body- both physical and emotional. Stress that continues without relief can lead to a condition called- distress- a negative stress reaction.

The states of anxiety, depression, frustration and anger are accompanied by a variety of physical responses including palpitations, excessive sweating, diarrhea, indigestion, headache, and weakness. These responses are the outcome of the complex process by which the physiological systems of the body adapt to stress. This process has been termed 'the stress response' by pioneering researchers such as Dr. Hans Selye [1] of Canada.

Distress can disturb body's internal balance or equilibrium, leading to physical symptoms such as headache, upset stomach, elevated blood pressure, chest pain, sexual dysfunction and problem in sleeping.

The work of Dr. K.N. Udupa suggests that stress related disorders evolve gradually through four recognizable stages [2] initially; psychological changes such as anxiety, irritability and insomnia arise due to over stimulation of sympathetic nervous system. In the second stage, distinct physical symptoms such as high blood pressure, elevated heart rate or increased intestinal motility appear. In the third stage, a more profound physical and/ biochemical imbalance sets in, and evidence of malfunctioning organs manifests clinically. Finally, detectable and often irreversible lesions appear, often with severe symptoms requiring surgical or long term pharmacological management.

Emotional problems can also result from distress. These problems include depression, anxiety, worry, panic attacks. Stress becomes harmful when people engage in compulsive use of substances or behaviors in trying to relieve their stress. These substances or behaviors include food, alcohol, tobacco, drugs, gambling, sex, shopping and the internet.

Rather than relieving the stress and returning to relaxed state, these substances and compulsive behaviors tend to keep the body stressed and cause more problems. The distressed person becomes trapped in a vicious cycle.

Central Nervous System and Endocrine Systems

Central nervous system is in-charge of Fight or Flight response. The hypothalamus gets the ball rolling, telling adrenal glands to release stress hormones adrenaline and cortisol. These hormones raises heart beat and send blood rushing to areas that need it most in an emergency, such as muscles, heart and other organs.(Figure 1, 2)

When perceived fear is gone, the hypothalamus should tell all systems to go back to normal. If the CNS fails to return to normal, or if the stressor doesn't go away, the response will continue.

Chronic stress is also factor in behavior such as over eating or not eating, alcohol, drug abuse and social withdrawal.

Respiratory and cardiovascular systems

Stress hormones affect the respiratory and cardiovascular systems. During stress response, breathing will be faster in an effort to quickly distribute oxygen rich blood to the body.

In a person is already have a breathing problems like asthma or emphysema, stress can make it even harder to breathe. Under stress, heart also pumps faster. Stress hormones cause blood vessels to constrict and diver more oxygen to muscles so one will have more strength to take action. But this also raises blood pressure.

As a result, frequent or chronic stress will make heart work too hard for too long. When blood pressure rises, so risk of having a stroke or heart attack increases.

In recent years, yoga nidra has emerged as an effective preventive, alleviative and curative technique in the management of degenerative and ischemic heart disease. As an adjunct to conventional medical therapies, yoga nidra plays an important role at all the various levels of cardiac impairment.

Yoga nidra seems to operate via the same relaxation response by inhibiting sympathetic nervous system, by reducing the load of environmental and intrapsychic stress being relayed from the hypothalamus into the electrical conducting fibers of the heart via sympathetic nervous system [3]. As a result, heart rate, blood pressure and workload on the cardiovascular muscles are reduced [4].

According to psychologists, people who succumb to degenerative heart conditions such as ischemic heart disease, arteriosclerosis, myocardial infarction and angina pectoris often fit the same psychological pattern; they are tense, ambitious, assertive, and 'successful' people. This is the so-called 'type A personality' which appear to be at a higher risk of suffering a premature infarction or other cardiac incident [5].

The coronary –prone person tends to be one who works compulsively, eats, smokes, and drinks excessively and fails to relax or exercise adequately. He often fails to develop a positive outlet for his emotional tensions, appearing hard hearted and in expressive, when in fact he is highly sensitive. These find expressions in bouts of frustration, rage, anger, passion or violence. This frequent buildup of emotional pressure imposes an enormous strain on the heart, forcing it to labour excessively and fail prematurely at an early age. Yoga nidra is emerged as an excellent preventive and curative procedure in cardiovascular management.

Psychosomatic diseases

Yogic relaxation therapy has been effectively prescribed in conjunction with other medical and yogic procedures in the management of severe psychosomatic diseases, including cancer, bronchial asthma, colitis and peptic ulcer. These diseases are conditions in which psychological factors usually play a prominent role. Attacks of asthma, growth of cancers, exacerbation of ulcer symptoms or colonic irritation frequently arise as complex psychological reactions to emotional insecurity, interpersonal stress, intrapsychic conflict, hypersensitivity, rejection, frustration, and suppression, personal isolation and other deep seated emotional crisis.

Yoga nidra therapy leads to conscious and sub conscious recognition and analysis of these underlying psychological factors, and initiates the release of suppressed conflicts. It is therefore an important part of yogic and medical management of all psychosomatic conditions.

Researchers have recently become aware that psychosomatic patients often suffer from a suppressed or impoverished fantasy life in comparison to rest of the population [6].

A highly significant reduction in frequency and severity of asthma attack has been reported who practice yoga nidra. Many have been able to greatly reduce their dependency on drugs, while significant proportion have been able to discontinue medication altogether [7, 8].

Measuring stress

Stress can be measured by the following methods

- Psychological testing- Depression and anxiety stress scales (Holmer and Rahe stress scale is used to rate stressful life events.)
- Changes in blood pressure
- Galvanic skin response
- Digital thermometer (digital) which indicates activation of fight or flight response drawing blood from the extremities
- Cortisol is the main hormone released during stress response and measuring cortisol from hair will give a 60 – 90 day baseline level of an individual.

Stress is due to over activation of sympathetic nervous system, Yoga nidra brings suppression of sympathetic activation through relaxation.

Table-1: Hypothalamus controls sympathetic and parasympathetic nervous system

PARASYMPATHETIC NERVES "Rest and Digest"	SYMPATHETIC NERVES "Fight or flight"
Constrict pupils	Dilate pupils
Stimulate saliva	Inhibit salivation
Slow heartbeat	Increase heart beat
Constrict airways	Relax airways
Stimulate activity of stomach	Inhibit activity of stomach
Inhibit release of Glucose; Stimulate Gallbladder	Stimulate release of Glucose; Inhibit Gallbladder
Stimulate activity of Intestines	Inhibit activity of intestines
Contract bladder	Secrete epinephrine and norepinephrine
Promote erection of Genitals	Relax bladder Promote ejaculation and vaginal contraction

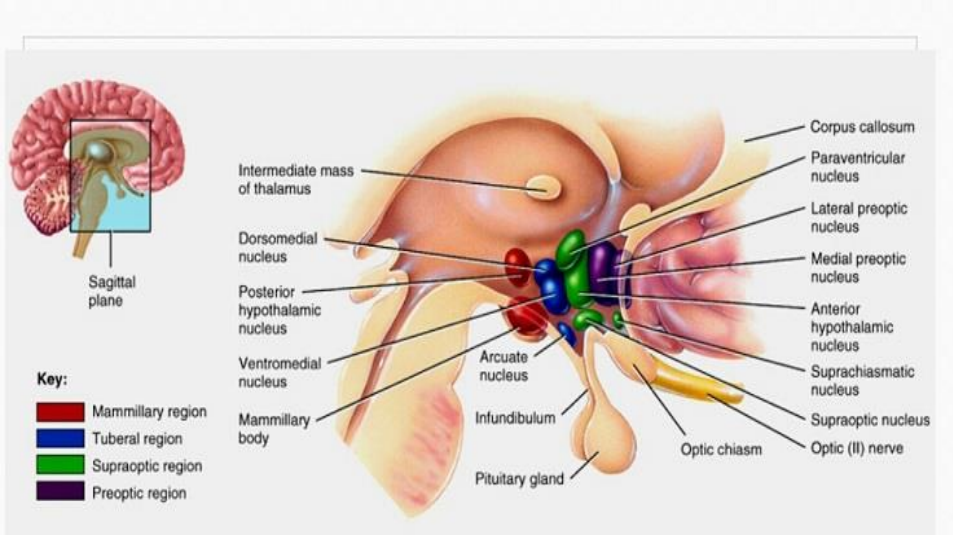

Fig-1: Brain and Hypothalamus

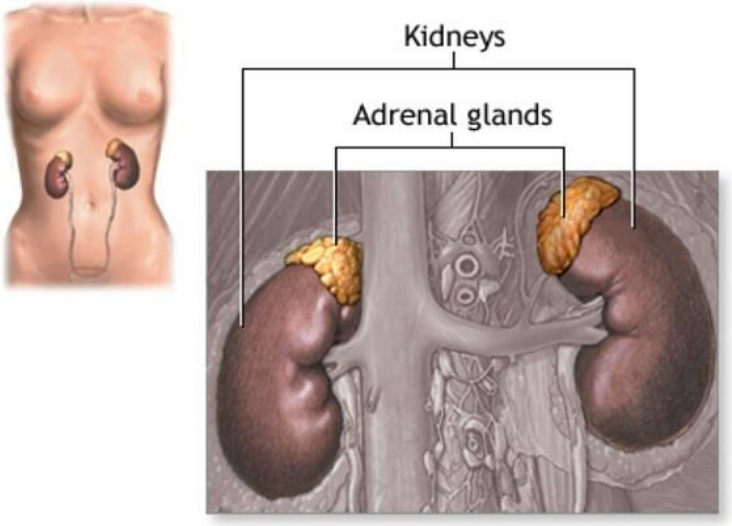

Fig-2: Adrenal glands release stress hormones

Yoga nidra

Yoga nidra is one of the spiritual practices for achieving spiritual progress in one's life. Profound relaxation that is achieved is the byproduct of the practice. Yoga nidra is a systematic method of inducing complete physical, mental and emotional relaxation. The term yoga nidra is derived from two Sanskrit words, yoga meaning, union or one- pointed awareness, and nidra which means sleep. During the practice of yoga nidra, one appears to be asleep, but the consciousness is functioning at a deeper level of awareness. For this reason, yoga nidra is often referred to as psychic sleep or deep relaxation with inner awareness.

In yoga nidra, the state of relaxation is reached by turning inwards, away from outer experiences. If the consciousness can be separated from external awareness and from sleep, it becomes very powerful and can be applied in many ways for example, to develop memory, increase knowledge and creativity, or transform one's nature.

The initial purpose of yoga nidra is to relax the body and mind, and when you come to the last stage of the practice you try to dissociate yourself from the body and mind.

Tension, stresses and strains only afflict you when you identify yourself with your body and mind. In the night, when we enter profound sleep, process of dissociation takes place automatically. You don't remember your name, your body, or nature of surroundings during profound sleep. In the same way, during practice of yoga nidra, after entering a state of deep relaxation, you should try to dis identify yourself emotionally from your body and mind.

Developing emotional control

Electrical stimulation of specific parts of hypothalamus, limbic system, amygdala regions of the brain is found to elicit specific emotional responses including rage, aggression and fear. For most people, these negative feelings are harder to control than positive emotions such as joy, security and pleasure.

The practice brings into simultaneous operation nerve circuits in the opposite hemispheres of the brain which, under normal circumstances never operate at the same time.

The new neuronal circuit is established which incorporates two previously irreconcilable states of awareness simultaneously. E.g. level of hatred, pleasure and pain, joy and sorrow and witness awareness of the conflicting and contrasting emotional reactions are maintained.

With repeated practices, this new circuitry becomes established response, enabling the practitioner to gradually go beyond the realm of an attachment and aversion for duality of life experiences.

In the life of spiritual aspirant, transcendence of this duality is a primary goal. Yoga nidra thus develops control of emotional reactions and automatic responses. This evolutionary advance is reflected in the daily life as increase personal awareness, emotional control and increased conscious destiny.

Sleepless sleep

Yoga nidra has been termed 'sleepless sleep' because we learn to enter state between sleep and wakefulness without loss of consciousness.

Table-2: Different states of consciousness and brain waves and realm of experience

Stage	State of consciousness	Psychological dimension	Brainwave pattern	Realm of experience
1	Awake	Conscious mind	Beta (13-20 cpc)	Sensory awareness, external knowledge
2	Yoga nidra	Superconscious mind (turiya), borderline between awake and asleep	Alpha (8-12 cpc)	Deep relaxation, visionary states, conscious dreaming, archetypal imagery
3	Dreaming	Sub conscious mind	Theta 4-7 cpc	Release of emotions, suppressed fears and desires
4	Deep Sleep	Unconscious mind	Delta (0-4 cpc)	Awakening of instincts and primitive drives

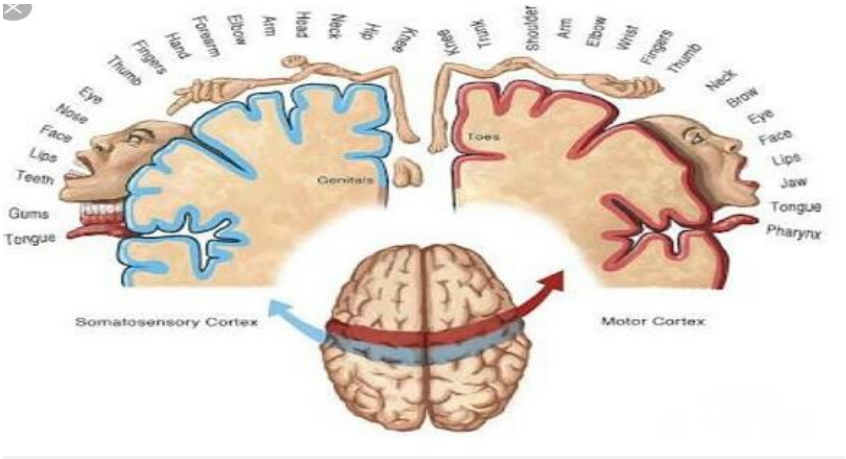

Fig-3: Shifting of consciousness (part of 'Yoga nidra' practices) relaxes body and brain

CONCLUSION

Stress is linked to six of the leading causes of death: heart disease, cancer, lung ailments, accidents, cirrhosis of liver, and suicide. It is also linked to compulsive use of substances or behaviors to try to relieve their stress. These substances or behaviors include food, alcohol, tobacco, drugs, gambling, sex, and the internet.

The process of stress management is named as one of the keys to a happy and successful life in modern society. Yoga nidra practice surely counters the stress and associated health problems like hypertension, diabetes, psychosomatic diseases like asthma, peptic ulcers, colon irritation, hyper acidity, insomnia. The practice is simple, having profound benefits.

Ethical clearance: Not required

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Conflict of interest: Nil

REFERENCES

1. Selye H, Stress without Distress JB Lippincott Co, NY.1974.
2. Udupa KN, 'Pathogenesis and management of stress disorders', Quart. J. Surg. Sci. Banaras Hindu University. 13(2):56, June 1977.
3. Orme-Johnson DW. Autonomic stability and transcendental meditation. Meditation: Classic and contemporary perspectives. 1984:510-8.
4. Puente AE, Beiman I. The effects of behavior therapy, self-relaxation, and transcendental meditation on cardiovascular stress response. Journal of clinical psychology. 1980 Jan;36(1):291-5.
5. Orth-Gomér K, Ahlbom A. Impact of psychological stress on ischemic heart disease when controlling for conventional risk indicators. Journal of human stress. 1980 Mar 1;6(1):7-15.
6. Osti RM, Trombini G, Magnani B. Stress and distress in essential hypertension. Psychotherapy and psychosomatics. 1980;33(4):193-7.
7. Hock RA. Medical –psychological intervention in male asthmatic children- an evaluation of physiological change', Psychosom. Med. 40(3): 210-215.
8. Erskine-Milliss J, Schonell M. Relaxation therapy in asthma: a critical review. Psychosomatic medicine. 1981 Aug 1;43(4):365-72.