



SCIENTIFIC APPROACHES OF STRESS RELEASING TECHNIQUES AND MEDITATION: A REVIEW STUDY

***Suparna R. Deshmukh**

S. K. Gandhi College, Kada, Dist. Beed

ARTICLE INFO

Article History:

Received 20th March, 2018

Received in revised form 27th

April, 2018 Accepted 5th May, 2018

Published online 28th June, 2018

Key words:

Cortisol, Nor- Adrenalin, Cytokinines, SudarshanKriya Meditation.

ABSTRACT

It is the pressure exerted by increasing demands of human life leads to develop stress on every cell and tissue of human body. Stress created by cravings and aversion produces lots of adverse effects on physiology, anatomy and psychology of a person. Levels of Cortisol hormone in blood is responsible for developing stress. SudarshanKriya and Meditation are the basic techniques used as stress releasing techniques since 1980s. Present study discusses effect of SudarshanKriya and Meditation on human body. SudarshanKriya is a natural rhythmic breathing technique used to release stress, tensions, and depression by minimizing stress hormone, Cortisol level in the blood. Prolactin, a beneficial hormone, level has been found to increase simultaneously. The blood lactate levels shown remarkably fall while there is increase in anti-oxidant enzymes levels. Electroencephelogram has shown indications of high alertness with increase in Beta-activity is observed in the left frontal occipital and midline regions of brain. SudarshanKriya is taught in special programmes conducted by Art Of Living Foundation worldwide. Meditations taught by this foundation has shown to increase confidence, concentration and creativity along with calmness of mind and clarity of thoughts as the prominent effects.

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INTRODUCTION

In ancient times, in India, purification of body was done by using several techniques like meditation, and yoga. With the evolution process stress started developing on human body since childhood with increasing demands and luxury. Tension and stress are being pulled out from every cell of human body and along with the basic needs, stress release has found its way as a daily need in human life. A process called Sudarshan Kriya, is a rhythmic breathing technique which releases stress, tensions, depression and also brings an effective control on emotions. It is an unique and the only tool which helps in directly controlling emotions through rhythmic breathing. Rhythmic breathing is a unique method for balancing the autonomic nervous system and influencing psychological and stress-related disorders. It is the only technique which shows its impact effectively in controlling emotions. Meditation creates calmness in mind and it is the serene and calm mind which is most powerful in taking and implementing decisions. The word Sudarshan means proper vision and Kriya means a purifying action. Through the action of our breath we get a proper vision of who we really are. There is a rhythm in the nature, like seasons come and go in time.

Similarly there is a rhythm in human body, in thoughts, in emotions, in breath and in our being too. SudarshanKriya helps in experiencing rhythm of a Being and through the rhythms of the breath different seven levels of existence of human being gets harmonize. Harmonising all systems of the human body rhythm, is the main effect caused by SK, through which stress gets released. Depression is being spreading and increasing day by day and in developed countries like Europe, U.S.A, U.K its percentage is near about 40-45% which is increasing and becoming risky to human health. SudarshanKriya and its accompanying practices (SK&P), are time-honored stress management health promotion techniques whose health benefits are being validated by modern medical science and obtaining transcendental meditative state of mind is an ultimate result of it. It can be applied as an alternative medicine with all stress related ailments as; in 2010; SudarshanKriya has been declared by World Health Organisation, as an anecdote for more than 150 psychosomatic diseases.

Objective

The main aim of the present study is thus to study the scientific approaches towards these stress releasing techniques and their effects on human body after practising it regularly. Present studies includes review of researches on SudarshanKriya and Meditation.

***Corresponding author: Suparna R. Deshmukh**

S. K. Gandhi College, Kada, Dist. Beed

Method of Data Collection

The researcher has collected data based on secondary data.

Analysis of Data

Scientific studies suggest connections between body and the mind implying that emotional state and thought processes affect brain, endocrine system and also the immune system. A new discipline has emerged based on these concepts called as Psychoneuroimmunology or body- mind medicine. Perception of stress leads to restlessness, anxiety, irritability or aggressive behavior and/or a state of panic, in extreme cases, even addiction to tobacco, alcohol and/or drugs. Negative emotions surface in the form of hatred/dislike, jealousy, greed, possessiveness, lust, arrogance and anger. Further, interpersonal relationships are adversely affected, work out-put decreases and power of concentration wanes. Efficiency goes down and memory weakens. Most of us are afraid to acknowledge our negativity and so we begin finding fault with others. We start complaining, which adds further to our stress; a vicious cycle begins. Body too is affected by stress. Pulse increases, heart pounds and we start perspiring hands become cold and clammy. This is caused by the release of several hormones, chemicals and cytokines from our endocrine glands and immune cells, which are activated in response to the perception of stress. While the body can adapt to acute stress and does not suffer much damage, exposure or perception of repeated stressful situations (chronic stress) leads to irreversible physiological changes, resulting in diseased states like high blood pressure, diabetes, heart attacks, asthma, gastrointestinal ulcers, viral infections, migraine/non-specific headaches etc. The main purpose of SK is to provide people from all layers of society, with practical and effective tools, derived from ancient practices on science of breath, to alleviate stress, improve health and increase wellness.

Effects of SK&P on Cortisol

Cortisol and Nor- Adrenaline: Cortisol is a stress hormone and it's a steroid hormone produced within the adrenal gland. It is released in response to stress and low blood glucose concentration. As such it functions to increase blood sugar through gluconeogenesis, to suppress the immune system and to aid in the metabolism of fat, protein and carbohydrates. It also decreases bone formation. Cortisol is a Stress Hormone which is harmful to body while Nor-Adrenaline is a useful Hormone for body. When Cortisol is released in blood, due to stresses, Nor-Adrenaline (NA) or Nor-epinephrine level gets badly affected. NA is synthesized and released by Central Nervous System. It is used as a neurotransmitter by sympathetic ganglia. The general function of NA is to mobilize the brain and body for action. Vedhmrthachar A, *et al*; studied Antidepressant efficacy and hormonal effects of SudarshanKriya in alcohol dependant individuals and found out that SK practices are effectively useful for de-alcoholisation of addicted patients. Agte V. V and K. Tarwadi done studies on SK as Alternative and Complimentary therapies for treating Type 2 Diabetes. Sharma H, *et al* has carried out comparative studies between regular practitioners of SK and non practitioners and concluded that SK practitioners exhibit better anti-oxidant status and blood lactate levels. Similar studies were carried out at NIMHANS, Bangalore, which concluded that SK&P indeed leads to relaxation, and was further confirmed by the measurement of blood Cortisol, a stress hormone, in 21 healthy individuals of

35-40 years of age. Regular practitioners of SK had very lower, negligible level of Cortisol in the blood at the base line indicating that they are less stressed and there was further fall during Kriya. Among beginners, fall was greater during SK as compared to when they were listening to music, confirming that SK and P was indeed more relaxing than listening to classical music also. Katzaram M.A. *et al*, found out that SK relieves anxiety and depression, while Seppala E.M, Descilo *et al*, and Martin A, have studied Post Traumatic Stress Disorder and symptoms, and reduced stress levels were found out by Kjellgre A, Agte V. V, and Kharya C. Seppala E. M also found that Plasma Prolactin, a well being hormone which is believed to be a key factor in producing depression relief, increased significantly after the very first SK& P session.

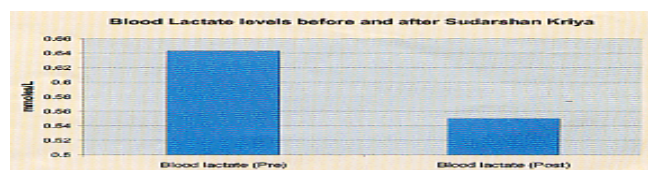
Effect of SK & P was studied on human immune system, the system which protects us from disease. (Science Of Breath,AOL).



Effects of SK&P on Blood Lactate

Blood lactate is another chemical which increases during stress. Studies were carried out at All India Institute Of Medical Sciences, Banglore, on 10 individuals those undergoing police training as these were the highly stressed groups since undergoing intense physical training on a daily basis. Blood Lactate was measured before and after SK&P. There was a marked fall confirming that SK&P induced a state of relaxation. SK&P significantly decreased lactate (an indicator of tension and stress) in the blood of police trainees. Jyotsana V.P, *et al* studied Comprehensive rhythmic breathing programme and found out that it improves the quality of life in patients with diabetes. Sharma H., *et al* concluded that SK practitioners exhibit better antioxidant status and lower blood lactate levels.

Blood Lactate Levels Before and After SK



Effects of SK&P on EEG

In a comprehensive yogic breathing programme a controlled pilot trial was taken by Kjellgren. A, *et al*. According to which, the P300 ERP EEG brain wave pattern and NREM brain wave pattern, which measure electrical brainwave activity and are abnormal in many depressed people, returned to the normal range by 90 days. At NIMHANS, Janakiramaiah, N, and Gangadhar B.N., *et al*, studied therapeutic efficacy of Sudarshan Kriya in dysthymic disorder. EEG changes were recorded on 19 practitioners with 15 controls to study the long term effects of SK&P. Significant increase in beta-activity was observed in the left frontal occipital and midline regions among Sudarshan Kriya practitioners compared to controls (p less than 0.05). Bhatia M., *et al* studied electrophysiological of

SK on EEG, BAER, P300 study. Neurologists interpreted these findings as indicative of heightened alertness.

Effects of Sahaj Samadhi Meditation

A peculiar meditation technique called, Sahaj Samadhi meditation is being taught by Art Of Living foundation is a automated self meditation technique. It has shown to reduce significantly the anxiety and depression. This type of meditation is also said as self transcending meditation. Zareen Amtul, *et al*; has studied the effects of automatic self transcending meditation on heart rate variability in patients of depression. According to this study carried out as late life depression, a 12 week programme lead to significant reductions in severity of anxiety and depression. This study has shown that the ASTM, Automated Self Transcendental Meditations can be used as an effective treatment in patients of late life depression. Akshaya Vasudev, *et al* has also studied effects of meditation in late- life depression. Sahaj is a Sanskrit word which means effortless or natural, while Samadhi is a deep, blissful, meditative state. Hence such type of meditation is a natural, effortless technique of meditation. Practising this technique regularly, relaxes the mind and rejuvenates the system. As the body relaxes mind expands and as the mind expands, body gets more and more relaxation. Thus practising this technique regularly alleviates all stress related problems. Consciousness in relaxed and calm mind dawns and awareness and creativity develops. Sahaj Samadhi Meditation allows the conscious mind to settle deeply in its self and provides complete rest thus dissolving the mind. The one who practices Sahaj Samadhi Meditation regularly gets advantage of enhanced 5 C's as outcomes of regular practice of meditation. These 5 C's are Calmness in mind, Clarity and Control Of Thoughts, Concentration enhancement, Creativity and Confidence. Further, it makes more energetic, and increases inner peace, self awareness, emotional stability, better physical health, experiencing tranquility. A meditative state of mind, intuitive ability is developed permanently by practicing Sahaj Samadhi meditations taught by Art Of Living Foundation. "Samadhi is a very deep state of meditation and a practitioner is given bundles of energy and long lasting bliss. It carries you higher and higher until your very presence radiates love..." says Sri Sri Ravishankar, founder of foundation Art Of Living. Sahaj means easily and naturally. After repeating Mantra for very few seconds mind settles down immediately and transforms into transcendental state. Thus Sahaj Samadhi Meditation is effortless transcendence within 20 minutes of regular practice.

Effect of SK&P on Blood Cholesterol

Psychosocial stress is a major contributor to hypertension and coronary heart disease (CHD). In CHD, deposits of LDL cholesterol, fat and other substances on the arterial walls slow or block the flow of blood, resulting in heart malfunction. A study was conducted at NIMHANS, to assess the cholesterol levels of individuals before they learned SK&P, as well as after 7 and 45 days of regular practice. Significant drops in cholesterol and LDL (harmful) cholesterol as well as increase in HDL(beneficial) cholesterol were observed. These findings suggests SK&P improves the blood cholesterol profile, and that regular practice may therefore prove to be an effective tool in preventing and arresting hypertension and CHD. To study effect of SK&Y on Lipid Profile, Pulmonary function and Haemoglobin concentration, Anjum Sayyed, Jyotsana Patil *et*

al; conducted 8 days workshop consisting of 150 participants. Out of these 55 were included for study samples. After practicing SudarshanKriya, results revealed that, there is decrease in Total Cholesterol, LDL Cholesterol along with significant increase in HDL Cholesterol. They also found significant changes in Pulmonary function, but statistically non significant changes in Haematological parameters. From these observations it is concluded that SudarshanKriya Yoga plays a vital role in reducing Total Cholesterol, (P< 0.05), LDL Cholesterol (P< 0.001), and significantly increase in HDL Cholesterol (P< 0.001). Spirometric Pulmonary Function tests studied were Forced Vital Capacity, Forced Expiratory Volume in first, second Peak Expiratory Flow Rate and Maximum Voluntary Ventilation. The results showed improvement in all Pulmonary Function Parameters in all subjects as compared to before practicing SudarshanKriya Yoga. Thus SudarshanKriya Yoga may have therapeutic implication in the adjunctive (non pharmacological) management of cardiovascular diseases and respiratory diseases. These studies proves that for CVD, SKY can be effectively used as complimentary treatment for patients. Basic logic lies behind it is that, due to these practices, every cell in the body gets proper oxygen supply, thereby it reaches to every organ through blood vessels improving metabolism of human body.

Table 1 Mean values of Lipid Profile in subjects participated before and after SudarshanKriya at Kimsu, KARAD, J. Med. Sci., Vol 3, No.1

| Biochemical Parameters | Before SKY(N=55) | After SKY(N=55) |
|-------------------------------------|---------------------------|-----------------------------------|
| Total Cholesterol mg/dl | 170.6 ± 38.9 (104 - 254) | 163.4± 26.94* (110 - 225) |
| Serum Triglyceride mg/dl | 72.29±27.26 (37 - 141) | 82.07± 34.86 (45 - 205) |
| Very Low Density Lipoproteins mg/dl | 14.36± 5.38 (07 - 28) | 17.54± 11.03* (09 - 80) |
| Low Density Lipoproteins mg/dl | 108.70 ± 37.27 (51 - 190) | 93.61±25.49*** (42 - 149) |
| High Density Lipoproteins mg/dl | 47±9.88 (30-75) | 53.56± 9.66*** (35 - 70) |

***P <0.001, * P <0.05, Non Significant as compared to before

Table 2 Mean values of Pulmonary Function Tests in the subjects participated before and after SKY at KIMSU, Karad. N=55 J. Med. Sci., Vol 3, No.1

| Pulmonary Functions Tests | Before SKY(%of predicted) | After SKY(% of predicted) |
|--|---------------------------|---------------------------|
| Forced Vital Capacity (FVC) | 90.38 ±10.34 | 98.54 ± 11.22** |
| Forced Expiratory Volume in First,Second(FEV1) | 101.71 ± 11.37 | 107.71 ± 11.80** |
| Peak Expiratory Flow Rate(PEFR) | 74.0 ± 19.59 | 89.92 ± 15.98** |
| Maximum Voluntary Ventilation(MVV) | 75.94 ±12.04 | 86.87 ± 13.54** |

**P<0.01 statistically significant as compared to before SKY

An open label intervention study was undertaken by Agate Vaishali., *et al* on 26 mild hypertensives & 26 apparently healthy adults of age about 30-60y, for effect of SKY practice for 2 months as complimentary therapy. It was found that there is a considerable decrease in diastolic blood pressure (P<0.01), Serum urea (P<0.01) and Plasma MDA as Oxidative Stress Markers(P <0.05) in case of hypertensives. In maximum number of samples, values above normal range of parameters

got lowered while those within normal range remained unaltered.

Some of the researchers Swapna Subramanian, Tamiselvi Elango., *et al* and also Subramanian S., *et al*, studied Role of SK&P on lipid profile and blood cell parameters during exam stress as a randomized controlled trial. For this study, blood samples of 43 engineering students were collected at four intervals namely baseline(BL), exam stress(ES), three and six weeks practice of SK and P during exam stress. Lipid profile and Haematological parameters were measured at all four intervals. Studies revealed that, three to six weeks practice of SK&P, reduced the elevated lipid profile, haematological parameters and improved lymphocyte levels. It was carried out to study in detail for parameters such as ES elevated Total Cholesterol(TC), Triglycerides(TGL), and very low density lipoprotein(VLDL). While Haematological parameters affected by ES included neutrophils, lymphocytes, platelet count, packed cell volume (PCV) and mean cell volume (MCV). It indicated that SK&P practice can overcome ES by improving lipid profile and haematological parameters. Narnolia, P.K *et al* studied effect of SKY on Cardiovascular Parameters and Comorbid Anxiety in patients of Hypertension. This include study of effect of SKY on Cardiovascular health (SBP, DBP, PR, Lipid Profile) and Hamilton Anxiety score in 100 hypertension patients. All patients were taking prescribed medicines on hypertension. Study group asked to do SKY one hour daily or at least five times a week for continuous three months after proper training. Statistically significant benefit of SKY was obtained in SBP, DBP, PR, Lipid Profile and Hamilton Anxiety Score in patient of hypertension as decrease in the values of all these parameters on three months of practice of SKY were observed. Effect of controlled breathing exercises, SKY on the psychological status and cardiovascular autonomic tone was studied by Kharya C. *et al* and found out that SKY has a purely scientific base and is an ideal tool for improving health. AshwiniDhawan and Rosemary Peter also studied Effect of SKY on Cardiac and Pulmonary functions. Rhythmic cyclical breathing technique of SKY was taught to 50 participants of 20-50 y age group of both genders. Before beginning and after one month of intervention of SKY, the Cardiac autonomic and pulmonary function tests has shown improvement in all parameters of these tests. In this protocol all participants practiced SKY minimum for 45-60minutes for six days and was continued for a month as minimum four days a week. Heart rate and blood pressure decreased $P > 0.05$. An increase in HF and decrease in LF/HF ratio were observed. FVC, FEV1, PEF, & FEV1/FVC were improved $P > 0.05$, it was found out that long term intervention of SKY would be promising and could be used as a complimentary treatment for improved health.

CONCLUSIONS

Since ancient times, breathing techniques are often recommended for relaxation and stress management. SudarshanKriya is a type of controlled cyclical breathing technique accepted worldwide as it is taught by a nonprofit International Organization, Art Of Living, in India as well as in more than 155 countries worldwide. People from more than 1575 countries has taken lessons of it. It is the breath which forms a controlling bridge between body and mind and the emotions too. Breath sorts out imbalances in the mind and body. When the mind and emotions becomes controlled it becomes very easy to achieve balances in behavior and

activities. Controlled and relaxed mind only can spread positivity in the society. This forms the basis behind SK practices. With the regular practice of SKY&P, one can experience flow of positive emotions, replacing anger, greed, frustrations and jealousy. The body feels relaxed, mind calmer and thus healthier and younger. EEG, blood cortisol and blood lactate levels reflect a state relaxation, yet alertness. Increase in Nor-Adrenaline level and decrease in Cortisol level in the blood, proves utility of SK&P. Increase in NK cells and antioxidant enzymes suggests that regular practice might prevent many diseases including infections and possibly even cancer. Fall in Cholesterol and blood pressure, can prevent cardiac disease and depression is cured in 80% of cases. The one who practices Sahaj Samadhi Meditation regularly gets advantage of enhanced 5 C's as outcomes of regular practice of meditation. These 5 C's are Calmness in mind, Clarity and Control Of Thoughts, Concentration enhancement, Creativity and Confidence. Further, it makes more energetic, and increases inner peace, self awareness, emotional stability, better physical health, experiencing tranquility. Even though further studies are needed, available data reveals that both of these practices can be used efficiently for transforming society stress free and violence free with improved interrelationships enhancing peace in society.

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How to cite this article:

Suparna R. Deshmukh (2018) 'Scientific Approaches of Stress Releasing Techniques and Meditation: A Review Study', *International Journal of Current Advanced Research*, 07(6), pp. 13653-13657.
DOI: <http://dx.doi.org/10.24327/ijcar.2018.13657.2449>
