



REVIEW ARTICLE

AYURVEDIC MEASURES TO COMBAT SPORTS INJURY RELATED EMOTIONAL STRESS- A REVIEW

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ABSTRACT

Sports performance is not only simply product of physiological & biochemical factors but psychological factors also play crucial role in determining performance. Developing coping techniques is most important in balancing stress level so that they optimize instead of inhibit the performance level. Psychological factors have been shown to be important antecedent to the onset of athletic injuries and also play important role in injury rehabilitation. Sports injury recovery typically focuses on physical rehab but it is also important to include sports psychology and emotional reaction, however rehabilitation may be affected by problematic emotional reaction such as, anxiety, loss of confidence, lack of motivation, frustration, irritation, feeling disengaged etc., stress has been shown to cause increased muscle tension, and coordination difficulties. Ayurveda is inherently a psychological as much as it is physical system of medicine. Ayurveda can provide a good alternative to sports psychology through the psychological components such as drugs, diet, *Panchakarma*, lifestyle changes and meditation and yoga etc. In fact the integrated approach of modern technological development and incorporation of ayurvedic measures both in fitness as well as in therapeutic level would be highly beneficial in sports psychology.

Keywords: Sports Medicine, sports injury, emotional stress, Ayurveda, Yoga

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INTRODUCTION:

Sports performance is not simply product of physiological and biochemical but psychological factors also play role in determining the performance. Sports medicine as separate medical speciality has fairly recent origin. In Ayurveda though we do not find readymade management for sports injury but close observation correct perception of implied meaning of ancient words of wisdom shows enormous possibilities in sport injury.

Sports medicine is an area that involves healthcare professional from variety of disciplines. It is curative, rehabilitative and preventive in nature. It is assumed that sports related problems are by default musculo - skeletal but, illness or injury in sports can be caused by many factors, from environmental , physiological to psychological also^[1]. The issue of anxiety is important aspect of performance. Stress is natural bye product of all our activities. Our body responds to acute stress by liberation of chemicals. This is known as fight and flight response of the body which is motivated by adrenaline and other stress hormones and is compromised of such physiological changes as increased heart rate, increased BP, increased breathing rate, muscle

tension, dilated pupils dry mouth, increased sugar etc. The stress hormones which are protective initially and liberated for self-preservation may cause damage due to overproduction in long run. This has an effect on metabolism, the rate at which cell grows and repaired and production of cell in immune system. The hormonal surge of glucocorticoid becomes detrimental in long run. This hormonal imbalance increases appetite and causes obesity. Catecholamine increases BP particularly in combination of high cholesterol and lipids leads to heart disease, stroke. The brain and neurons are also crucial target to elevated glucocorticoid and may be damaged by stress and adrenal steroids^[2].

MATERIAL & METHOD:

Stress may be defined as demand in situation exceeding the resources to respond to those demands. Athletes who experiences high level of stress whether on of the field are at great risk of being injured. Stress causes attentional changes, general distraction, increased self conscience that interferes with athletics performance.

Selected sign and symptoms of Stress- as shown in the table no. 1^[3].

Table no. 1: Selected sign and symptoms of Stress

Behavioral	Physiological	Psychological
Difficulty in sleeping	Feeling ill	Negative self talk

Lack of self talk	Cold clammy extremities	Uncontrollable
Overwhelmed	Profuse sweating	Intrusive
Substance abuse	Headache	Negative thoughts
Consistently better performance in practice than competition	Increased muscle tension	Self doubt
	Altered appetite	Inability to concentrate

Psychological factors in sports person can be classified into four categories^[4]

1. Psychological variables for occurrence of injury
2. Psychological response to injury
3. Psychological aspects of rehabilitation process
4. Psychological readiness to return to sport

Psychological variables for occurrence of injury: Certain athletes such as those experiencing high life stress, low personal coping skill, narrowing of attention, general distraction, increased self consciousness are at great risk of injury due to increased muscle tension and coordination difficulties.

Psychological response to injury: For many athletes, exercise and physiological activities serves as primary coping mechanism for dealing with psychological issues. In these athletes an injury may result in greater emotional upheaval. Emotional response to injury includes feeling of isolation, frustration, lack of motivation, alteration in sleep & appetite, sadness etc. Introverts may take long

time for recovery as they become apprehensive, guarded and indecisive.

Psychological aspects of rehabilitation: Rehabilitation may be affected by problematic emotional reactions like loss of identity, fear, anxiety, loss of confidence, general impatience, irritability, extreme guilt about letting the team down and rapid mood swing. Communication skill motivation, enthusiasm self talk are important aspects of rehabilitation, while negative emotions are greatly related to unsuccessful rehabilitation outcome.

Psychological readiness to return to sport: Emotional reactions, apprehension may become problematic and increases the probability of re injury. Not getting relief up to their expectations, over exercise to increase performance can harm and postpone full recovery.

Psychological intervention can help them to overcome and manage negative emotions, to reduce the fear to get re injured and anxiety when athletes return to play.

Management of stress in sports person:

Ayurveda is science of life which comes from Vedic Civilization of India. It most ancient comprehensive health system in the world. The fact that 'prevention is better than cure' is well recognized in Ayurveda, as its foremost objective is maintenance and promotion of health of the healthy. Ayurvedic treatment of stress management identifies and differentiates between all three *doshas*- *Vata*, *Pitta*, *Kapha*

1. Vitiating in *Vata dosha* gives rise to grief and infatuation
2. When *Pitta dosha* increases and manifests in body, there is production of mental states of excessive fear, lust, anger, and grief.
3. Similarly imbalance in *Kapha dosha* may cause lethargy, anxiety and in discrimination.

Sports should help to maintain inner balance throughout the body and strengthens all organs and to make immune system stronger. In right amount it increases well being and reduces stress. To prevent stress there are two approaches, to avoid factors inducing stress and vitiating *doshas* and to increase the coping capacity of the body.

Avoiding Stress- Stress avoidance has been best appreciated by Caraka who states that in order to protect one's life one should always avoid over exerting himself, and stress needs

to be managed by strengthening the body's adapting capacity to the stress. The coping capacity of the body can be increased by lifestyle modifications, dietary interventions and/ or drug treatment, all these being well organized under the umbrella of *Rasayana* therapy, one of the eight branches of classical Ayurveda. Sushruta defines *Rasayana* tantra as the branch that improves longevity along with physical and mental strength and immunity^[5]. Ayurvedic approach to complete health is not fundamentally drug oriented, drugs being just one aspect of this multidimensional approach. All the same *Rasayana* therapy includes drugs, dietary regimens, and codes of conduct.

1. *Achara Rasayana* constitutes the balanced use of sense organs, non violence, and self control. This also suggests a regular routine free from stress^[6]. Ayurvedic treatment lay emphasis on sound sleep for fighting functioning and recharging of brain. Counselling with ayurvedic doctors for proper understanding about purpose of life and to derive self motivation and positive attitude.
2. *Ajasrika rasayana*-It is about observing a nutritious and balanced dietary routine^[7]. A balanced diet consists of all six *rasas* and modified as per *desa*, *kala*(climate,season,environment) age,

prakriti (dosha constitution) of the individual^[8].

Consume fresh green leafy vegetables, fruits along with the regular food.

- i. Drink water of Tulasi regularly.
 - ii. Boil 3-4 Sage leaves in a glass of water until 1/3 is evaporated. Add Jaggery to the mixture and consume it.
 - iii. Avoid tea, coffee and other caffeinated beverages.
 - iv. Avoid white fine flour and sugary products, frozen preserved and leftover food.
 - v. Include whole grains, cereals in daily food, which induces a greater sense of well being.
 - vi. Daily diet should be regularized in means of proper timings as well as nutritional balance.
3. *Aushadha Rasayana*: To obtain maximum benefits of Rasayana Therapy, one should regularly take *Rasayana* drugs after proper purification of body^[9], The healthy tissues can be obtained by,
- i. Directly improving *poshaka rasa* that in turn nourishes all *dhatu*/ tissues. *Satavari*(asparagus racemosus), *dugdha*(milk) and *ghrita*(ghee) are similar *Rasayanas*.
 - ii. Balancing *Agni*(digestion and metabolism) is equally important mean of promoting the quality of *dhatu*/tissues.

Bhallataka(*Semicarpus anacardium*) and *Pippali*(*Piper longum*) are *rasayana* acting in similar way.

- iii. An optimal competence of *srotas*/channels is another requisite for healthy body. *Guggulu*(*Commiphora mukul*) is the best example of *rasayana* effective at the level of *srotas*/channels.
- iv. *Dravya prabhava*, generally the drug with properties similar to pacified *doshas* and depleted *dhatu*/tissues and / or properties opposite to vitiated *doshas* and aggravated *dhatu*/tissues are used for treatment. Sometimes however, the beneficial effects of drugs cannot be explained in this simple ways. In that case, the drug is said to act by *dravya prabhava*. Most of the *Medhya Rasayana* act by *dravya prabhava*. Several *Rasayana* herbs used as anti stress agents have shown anti-oxidant, hepato-protective, anti-depressant and anxiolytic effects in various experimental and clinical studies.

Abnormal accumulation of OFRs(oxidative free radicals) leads to cell membrane lipid peroxidation. Toxic peroxide metabolites induce excessive cellular injury. Several *rasayana* drugs like *Asparagus racemosus*, *Bacopa monnieri*, *Boerhavia diffusa*, *Centella asiatica*, *Convolvulus Pluricaulis*, *Embellica officinalis*, *Piper longum*, *Tinospora cordifolia*, *Picrorhiza kurroa* *Curcuma longa*, *Withania*

somnifera have been shown to possess immunomodulatory and anti oxidant action^[10].

- Lavender oil as aromatic drops may be used in bath for relieving stress
- Massage of soles and feet with some warm oil like sesame oil and scalp with cooling oil like coconut, *Eladi tailam*
- The drug *Sankhapushpi* is cooling, calming, rejuvenating for brain. It is useful in insomnia, weak appetite and improves memory.
- *Brahmi* is brain tonic and increases intellect reduces stress and strain. Along with *aswagandha* and *Satavari* it gives calming effect to the brain, cures bilious head ach.
- *Brahma Rasayana* and *Saraswatharishta* are some ayurvedic formulations that are not only improves mental alertness, memory and stress threshold of an individual but also help in keeping the degenerative diseases of brain at a distance.
- Cow's *ghee* is beneficial for brain.

Managing stress with *Panchkarma* therapies

Panchkarma therapies help to expel the toxins and waste metabolite products out of the body, It improves the blood circulation and there by pulling out negative energy out of the body and mind which causes stress. Among them *sirodhara*, *abhyanga*, *snehapana*, *pzhichal*, *nasya*, *sirobasti* are some few

panchakama procedures which are helpful in reducing stress, reduces muscle tension by improving blood circulation and revitalizes the tissues. *Sirodhara*^[11] is the process in which medicated oils, milk, buttermilk is poured in a continuous rhythmic stream on forehead for particular fixed time. It is effective procedure indicated in psychic disorders, It stimulates *chakras*, awakens intuition, inner wisdom, relieves stress anxiety, depression and insomnia through natural serotonin, dopamine, and melatonin release. It helps in increasing concentration, deeply relaxes mind and body, improves sleep pattern pacifies *vata*, reduces anxiety, restlessness, irritability, nervousness, fear, excessive thinking and improves mental health. In *Tailadhara*, the medicated oils are poured on entire body, having variety of highly beneficial herbs. This facilitates the person to perspire, releasing the toxins through the skin. *Snehapanam* is oral administration of medicated ghee or oil In *Abhyanga* whole body is massaged using warm medicated oils, moving hands synchronously all over body followed by stem bath and shower. The oil nourishes the skin, revitalizes deeper tissues by improving blood circulation, releases tension from muscles and joints. *Sirovasti* is procedure where warm herbal oils are kept on head for 45 minutes to regularize circulation to the cerebral and nervous system. In *Thalam*, Special herbal

powder mixed with medicated oil is applied on head. *Nasya* is Instillation of herbal medications like oil, powder, fresh juices through nostrils to balance doshas from head,nose, throat region.

Role of Yoga- Meditation, Pranayama, Asanas:

Ayurveda integrates *Yoga, meditation, and Pranayama*(breathing exercise) to manage stress. Certain gestures called, *Mudras*(postures) are also helpful. Positive thinking, tidiness, clean environment and maintaining harmony at all level is important for getting rid of stress permanently. Oxygen is most vital nutrient in our body. It is essential for proper and efficient functioning of brain, nerves, glands and other internal organs. One of the major secret of energy and vitality is purified blood supply. The quickest and most effective way to purify blood is extra supply of oxygen from the air that we breath. Shallow chest breathing promotes early fatigue in athletes. Which affect their rhythm and timing and inevitably speed . A few yoga exercises practiced daily especially just prior to meditation, help to regulate the breadth and relax the body by gently releasing tension from muscles, flushing all body parts and brain with fresh blood, oxygen and other nutrients thus, increasing the feeling of well being^[12].

Yoga practices

- The Preparatory exercises- they remove stiffness from the joints and help the muscles to become flexible. Coordination between bones, joints, muscles, and ligaments improves so that they work naturally and spontaneously.
- *Surya namaskara*: This is a complete practice in itself. Players can use it for overall fitness and as a warm up before any sport. It prepares the body fo handling stressful situations. It is an effective way of loosening up, stretching, massaging and toning all joints, muscles, and internal organs of the body. It stimulates and balances all systems of the body.
- Backward and forward bending *Asanas*: They increase the strength and flexibility of the spine. The spine is responsible for posture, free flow of energy, nervous activities and body reflexes. Balance of the whole body depends on the power and flexibility of spine and adjacent muscles. By practising these *asanas* , one can minimize the problem of back pain. Much accumulated stress tends to stagnate in spine, especially in lower region or at the neck and shoulder. Hence backward and forward bending followed by one or two twisting *asanas*

relaxes the spine and give the feeling of alertness. Psychologically, backward bending *asanas* prepare players to face any situation with courage and optimism; while forward bending helps to let go with the flow; twisting gently squeeze out hesitation and uncertainty.

- Inverted *asanas*: These *asanas* encourage rich blood supply to the brain and reverse the effect of gravity on the body. During the practice of inverted *asanas* the breath becomes slow and deep, maximizing the exchange of carbon dioxide and oxygen, which encourages correct respiration. The abdominal organs receive powerful massage, helping them to perform their functions more efficiently. Blood and lymph which has accumulated in lower limbs and abdomen is drained back to the heart, lungs and again recirculated to all body parts. The enriched blood flow also allows the pituitary gland to operate more efficiently, tuning the entire endocrine system.
- Balancing *asanas*: These *asanas* induces physical balance by instilling unconscious movement. They develop the brain centers that control the body functions in motion thus

developing the connection between the body and mind. They increase coordination of movements between different parts of body, which develop the sense of poise and balance. They fine tune the efficiency of use of energy both in action and stillness. As the moving body attains balance, it becomes increasingly free to rely on other more subtle forces to support and propel it. In this way body conserves its own energy and achieves grace and fluidity of motion^[13].

- *Pranayama* or breathing exercises are one of the most effective means of increasing lung capacity, energy and stamina^[14]. *Pranayama* means control of life forces. When prana is restless, they affect the mind and vice versa. By controlling the *pranas* through the practice of *pranayama*, the restlessness of mind is automatically controlled. It also helps to control over involuntary muscles, enhances concentration and balances emotions. When practiced systematically and regularly, the awareness develops that energy is not purely physical in nature and that efficient management of *pranic* energy can be developed through control of the breath^[15].

i. *Bhramari pranayama* (humming bee) and *Ujjayi pranayama* ocean or victorious breath can be used before any sporting event to induce relaxation and reduce mental stress;thus bringing calmness and quietness of mind. It reduces feeling of self consciousness.

ii. *Sheetali & Sheetkari Pranayams* are good in hot, summer season.

iii. *Bhrasrika Pranayam*(rapid breathing from abdomen) generates heat, vitality and raises natural energy level.

iv. *Nadi sodhana Pranayama*(alternate nostril breathing) with *kumbhaka* (breath retention) also increases lungs capacity as well as being the main practice for balancing the *pranic* energy by stimulating both hemispheres. *Nadi sodhana* is the most commonly practiced Pranayama for stress relief. This breathing technique involves inhaling through the left nostril and exhaling through right nostril; then inhaling through the right nostril and exhaling through the left

v. Abdominal breathing naturally deepens the breath, calm us down and stabilizes the mood.

Fast breathing *pranayama*- *Kapalbhati*, *Bharastrika*, *Kukkriya*

Slow breathing *pranayama*: *Nadishodhana*, *Pranava*

Both fast and slow breathing pranayamas can be considered as deep breathing exercises performed at different frequencies of

respiration. There is significant decrease in BP and HR with the practice of *Pranayama*. Resting HR is determined by parasympathetic nervous system (PNS) and Diastolic blood pressure (DBP) is function of peripheral vascular resistance, which is mainly determined by Sympathetic nervous system(SNS). Decrease in DBP, HR,Mean arterial pressure represents increase in parasympathetic and decrease in sympathetic activity in slow *pranayama*. Rise in pulse pressure represents better tissue perfusion. Therefore regular *Pranayama* demonstrates decrease in sympathetic activity and increase in parasympathetic activity. Therefore both types of Pranayama practices are equally effective in reducing stress. Reduction in stress may have occurred due to better autonomic tone and reduced stress have resulted in improved cardiovascular functions in slow and fast *pranayama* [16].

• *Shatakarmas*

Neti, kunjaj, laghoo Shankh prakshalana and Trataka are four of the six cleansing practices which are considered important for sports persons. These shatkarmas helps sports persons to enhance concentration, induces calmness and balances body and mind. They induce confidence in players so that express themselves and give their best without fear and anxiety [17].

Yoga nidra(sleep): It is systematic method for inducing complete physical, mental and emotional relaxation. It works at three level simultaneously- The conscious, subconscious, and unconscious. Due to depth of relaxation, the level of awareness and focus increases. The level of receptivity is also greater; hence useful for learning skills and techniques. There is stage in *yoganidra* where a resolve is made which can increase will power and single mindedness to achieve success on the field. Players can develop the appropriate state of mind, so that at the time of need they can balance their physical , mental and emotional states. For most players negative emotional responses including rage, fear, and aggression can be hard to control during high level of stress. In *Yoga nidra* players are asked to submit voluntarily to strong emotions, while preserving a state of deep relaxation and witnessing the whole process. This helps to remain balanced and in control in any situation.

Meditative Process: meditation is method of calming our thoughts by focusing on an object for a period of time. One can concentrate on an object, picture, sound or “mantra”. According to recent researches, it has been found that meditation slows the down breathing process, normalizes BP, relaxes

muscles and helps to reduce anxiety and stress. There is technique of contemplation or meditation which allows close analysis of strengths, weaknesses, ambitions, needs that can make difference between success and failure.

CONCLUSION: The issue of stress is important aspect of performance whether it is during tense moments of game or amidst dreaded examination; anxiety affects our performance via changes in body. Many times stress of competitiveness may cause negative anxiety in one performer and positive excitement in another. Sports person faces the stress and emotional changes at various stages in their sports life. Due to long term training muscular imbalance can develop in body which can lead to damage and injury.

Along with other health care professionals, Ayurvedic management can give reliable complete recovery from stressful events. Ayurvedic management which is holistic in nature, comprises *Rasayana* drugs, Yoga and Meditation. This is useful for all types of sports to prevent injuries. One gets extra agility which helps to avoid damage, provides more strength and improves player’s ability to react to situation. Integration, balance & harmony are keywords of Yoga, asanas and breathing exercises. Asanas are based on gentle stretching of muscles, which induces relaxation and increases the blood

supply. These also release residual tension and speed up regeneration.

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