

Opinion

Somato-Psychic Aspects of Asana (Yogic Postures)

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Introduction

In modern yoga teaching and practice, stretching is the main focus of asana more often than not. This makes it imperative that we understand the anatomical and neuro-physiological aspects of stretching. Proprioceptive Neuromuscular Facilitation (PNF) stretching techniques have become popular and are extensively cited as the most effective techniques facilitating a greater experience of the stretch itself. PNF utilizes the shortening contraction of opposing muscles to place the target muscle on stretch followed by static contraction of the target muscle. This leads to enhanced Range of Movement (ROM), both active and passive [1-5].

Stretching in asana

Stretching in asana involve isometric contraction of various muscles groups and the agonist-antagonist activity. Muscle spindle stretch receptors are modified muscle cells that act as sensory receptors and are located within the belly of muscles. They detect changes in length and tonus of the active muscle and convey this information to the Central Nervous System (CNS) via sensory neurons. These spinal cord reflex arcs regulate contraction of muscles, by activating motor neurons via the stretch reflex that signal active muscles to contract and resist such excessive muscle stretch thus providing an instinctive protection against over-stretching or tearing. This has practical application in asana practice as it is important one doesn't try and force oneself into the asana.

If this were to be attempted, the muscles spindle activity would be intensified and the resultant "block" would prevent us from going further. When we learn to work with the spinal cord reflex arcs, we can on the contrary help "dissolve" such "blocks" and enter a deeper state of asana itself. It has been suggested that this can be done by either holding the stretch for 30-60 seconds thus causing muscle spindles to decrease firing or to back out of the posture part-way thus inducing relaxation of the muscle allowing for a deeper stretch into the asana. For example one could go into any of the forward bending postures such as padahasthasana or paschimottanasana and then back out part-way, so that after a few deep breaths one can go into the asana and attain a deeper and more relaxed "feel" of the asana.

On the other hand, the Golgi Tendon Organ (GTO) located in the Musculo-Tendon Junction (MTJ) relaxes a muscle immediately if there has been a sustained contraction lasting longer than 6 seconds. Thus it has been suggested that isometric contractions (the

hold phase) and concentric contractions (the contract phase) used immediately before the passive stretch (the relax phase) can help to facilitate autogenic inhibition that is reflex relaxation occurring in the same muscle where GTO is stimulated [1,3].

Reciprocal inhibition in asana

Another important aspect is that concentric contraction of the muscle group opposing that which is being stretched, helps achieve reciprocal inhibition that is a reflex muscular relaxation occurring in muscles antagonist to the agonist muscle where the GTO is stimulated. Reciprocal inhibition is an example of the Yogic concept of dwandwa or pairs of opposites well exemplified by agonist-antagonist coupling. When the agonist contracts the antagonist relaxes and vice versa. This knowledge can be used to enhance the experience of asana by contracting the agonist to relax the antagonist and deepen the posture. For example in paschimottanasana, the quadriceps would be contracted to relax the hamstrings through the primitive spinal cord reflex inducing reciprocal inhibition. This can be termed the modern equivalent to the yogic concept of spanda-nishpanda, activation-relaxation coupling.

A recent study has used biomechanical methods to quantify the lower extremity joint angles, joint moments of force, and muscle activities of 21 Hathayoga postures [6]. (Salem, 2013) The study demonstrated that Hathayoga postures engendered a range of appreciable joint angles, joint moments of force, and muscle activities about the ankle, knee, and hip, and that demands associated with some postures and posture modifications were not always intuitive. They also demonstrated that all postures elicited appreciable rectus abdominis activity, which was up to 70% of that induced during walking.

Another study by Wang and colleagues suggested that musculoskeletal demand varies significantly across the different poses and suggested that their findings be used to guide the design of evidence-based yoga interventions to address individual-specific training and rehabilitation goals in seniors [7]. The Crescent, Chair, Warrior II, and One-legged Balance poses generated the greatest average support moments while Side Stretch generated the greatest average hip extensor and knee flexor Joint Moments Of Force (JMOFs). Crescent placed the highest demands on the hip flexors and knee extensors. All of the poses produced ankle plantar-flexor JMOFs. In the frontal plane, the Tree generated the greatest average hip and knee abductor JMOFs; whereas Warrior II generated the greatest average hip and knee adductor JMOFs. Warrior II and One-legged Balance induced the largest average ankle evtor and invertor JMOFs, respectively. The electromyographic findings were consistent with the JMOF results.

Asanas and neuroplasticity

It is well known that voluntary physical activity and exercise training can influence neuroplasticity in a favorable manner by facilitating natural neuro-generative, neuro-adaptive and neuro-

protective processes. Dishman and others have suggested that these intrinsic and natural regenerative and rehabilitative processes may be modulated by neurotropic factors [8]. They suggested that metabolic and neurochemical pathways among skeletal muscle, the spinal cord and the brain offer plausible and testable mechanisms that might explain effects of physical activity and exercise on the CNS.

Regular exercise and conscious motor skill training occurring through asana practice may enhance executive functions of cognition and motor learning in the spinal cord. Such improvements would be especially beneficial to those having cognitive decline associated with aging, trauma and neurological disorders including dementia and stroke [8].

Asanas as simulators of life experiences

Asana-s is an excellent system through which one can work towards the restoration of psychosomatic harmony and balance. Regular, repeated and rhythmic practice of asana-s facilitate the restoration of the milieu interior as they gather attention to a particular muscle/organ/area enabling regeneration by developing a positive mental state [9,10] However it is often not understood that the actual efforts being made in asana are soma to-psychic in nature while the benefits that accrue are of a psychosomatic nature. The body is placed into different postures/poses/poses. This conscious and mindful placement of the body into certain ways helps simulate the experience of different levels of evolution such as reptilian, amphibian, mammalian, human and even super-human and divine states of being.

This is the reason why the ancient rishi-s taught their disciples to put their bodies into positions resembling lower life forms like trees, mountains, insects, birds and animals. The body remembers those past incarnations consciously when locked back into a form resembling those physical structures. By becoming “conscious of the unconscious” the jiva develops a metacognitive perspective (vairagya) that can deal effectively with its primitive conditionings. This detached witnessing puts space between stimulus – response and one can choose consciously how one will respond to situations rather than react with the animal response of “flight or fight”.

Asana-s such as bhujangasana enables us to experience what it feels like to be a cobra while the makarasana simulates the “feel” of a crocodile. This enables an emotional psychic cleansing of such bestial tendencies in a conscious and controlled manner. This can change our very perspective of the world in which we live. Interpersonal relationships take on new meaning and we begin to understand what it really takes to be ‘human’. Vrikshsana gives us a taste of the tree-like experience while vajrasana makes us feel more humane as only humans can sit in it. The veera/veerabhadrasana series enables courage and strength to develop while asanas named after great rishi-s such as vashistasana, matsyendrasana and bharatwajasana enable us to develop our higher nature. We can take this even further through the hanumanasana, trivikramanasana and natarajasana that simulate the divine experiences.

Conclusion

The somato-psychic effects of the asana also include the release of endorphins that induce a sense of relaxation, ease and wellbeing in the practitioner. These are triggered by stretching of the muscles in the asana-s and may be responsible for the positive feelings of self-empowerment and self-regulation often quoted by practitioners.

Consciousness is the key to control and Hathayoga fosters consciousness. One becomes deeply aware of old reptilian and animal instincts lurking in the primordial sub-conscious. The various practices purify and exorcise these old animal / reptilian conditionings. Swami Gitananda often explained this by saying, “All of the evolutionary history of life on this earth planet is contained in your brain. You have a reptilian brain and a mammalian brain, in common with those lower life forms and all their primordial instincts for survival: sexual drive, dominance, territoriality etc. are also active there. Then, you have the cerebral cortex, the human brain, which is no longer bound by instinct, but can make conscious choices. The problem facing man today is the lack of communication between this “old, unconscious brain” and the “new conscious brain”. Hathayoga is the superb technology which enables man to bridge that gap [10].”

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