

Editorial

Science of Yoga - Existential Eminence is the Evidence

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“The greatest scientists in history are great precisely because they broke with the consensus – Consensus is the business of politics” – Michael Crichton.

Yoga is known by the world as a set of esoteric exercises. To link yoga with exercise is a logical paradox. Yoga literally translates as a union, union of creation with the creator, or of the created with the creator. Postures, misconstrued as exercise, are just one of the steps, of the staircase that bridges, the created with the creator. There are eight steps in this staircase of union. Postures known as Asanas being one. The eight limbs enable us with social well being, physical fitness, intellectual awakening, mental peace and contentment. This eight limbed staircase is in perfect harmony with the definition of health by WHO, which defines health as a state of complete physical, mental and social well being and not merely the absence of disease or infirmity.

Link of exercise to the practice of medicine was prevalent amongst Greeks. The therapeutic benefits of physical activity were advocated by Paidotribe and Herodicus of Selymbria. Evolution of exercise medicine led to publication of first treatise in 1705 by Francis Fuller, establishment of a dedicated institute in 1911 at Dresden, a conference in 1912 at Oberhof, publication of first sports medicine journal in 1922 by French society and establishment of international federation of sports medicine at the 2nd winter Olympics in 1928 [1]. But the progress in concept of exercise linked medicine was halted by growing realization about its negative effects. In 1873, a New York physician Austin Flint concluded “the muscular system may consume its own substance by exercise” [2]. It created a flutter and was challenged by Dr. FW Pavy [3]. This paradox of exercise being beneficial while being potentially self-consuming, has been recognized in Yoga since its inception. The postures, known as Asanas are not muscle straining exercises. They rather are defined as “a posture that which is stable and is in pleasant harmony with the body conscious”. The other limbs of yoga, as well, are physiological in nature. Pranayam or ‘disciplining the breathing’ and not merely ‘breath control’ is another important limb of yoga. Pranayam evokes scientific amazement, by its ability to modulate the pro and anti-inflammatory cytokine pathways, leading to physiological optimization of diseased human body [4]. Modern science advocates interventions like biofeedback,

physiotherapy, psychotherapy and hypnotherapy etc. These therapies are used in expediting postoperative convalescence [5,6]. The cyclical harmonized muscular stretch and relaxation in yogic postures does not antagonize the benefits of exercise induced endorphin release, as seen with normal exercise induced released of cytokines. Similarly, the disciplined yogic breathing in Pranayam with a structured ‘inspiration – breath hold – expiration’ ratio being ‘1:2:4’, induce the release of endorphins/beta enkephalins, which cause euphoria and analgesia [7-9].

These Biomolecular level benefits of yoga have been shown to be beneficial in various inflammatory pathway driven unhealthy states. Yoga has been shown to reduce post-chemotherapy fatigue in level I studies [10,11]. Yoga reduces the TNF based inflammatory signaling in breast cancer survivors [12]. It even helps in lowering the gene expression linked to IL10 and NK cell populations in such patients [13]. The benefits of yogic meditation have been documented in various metabolic syndromes. Yoga has been shown to help in sleep disturbances with improvement in all sleep phase parameters. Yoga helps in improving immune status of the patients, fatigue reduction amongst medical specialists, mood disturbances, various psychotic disorders and aging-related physiology. These benefits have been documented with well-defined molecular and electrophysiological pathways with a detectable improvement in brain wave patterns in the anxiety / stress psychosis [13-21]. In pregnancy, including high risk ones, not only the safety of doing yoga but significant benefits have been reported [22]. We have utilized the yoga induced benefits in improving postoperative outcomes in surgeries, including colorectal surgeries with comprehensive application of all the eight limbs of yoga, including Pranayam and diet (Aahaar) [23-29]. The evidence to support the foundation of yoga is a scientific necessity in this era of modern science is premised on generating evidence following a rigid ‘hypothetico – deductive’ testing of hypothesis [30]. The need to pursue this methodology based research in yoga though necessary seems irrational, given the noninvasive, harmless, resource neutral nature of yoga. Modern science has developed research methodologies to shorten the observation time span in intervention. Intervention like Yoga has stood the test of time without any reported harm or need for additional resources. Practice of modern medicine is being driven by the convergence of innovation and molecular understanding with ancient wisdom eponymously named as Imagineering [31]. Such innovations and convergence cannot wait at the cost of depriving benefits to the society [32]. No well-designed studies have been demanded to question the established safety provided by a parachute in sky jumping. Common sense at times is better than the best evidence, being aptly named ‘the parachute level of evidence’ [33,34]. It is this common sense driven consensus that has given global acceptance to yoga. United Nations has declared June 21 as ‘International Yoga Day’ on a clarion call of Indian Prime Minister-Narendra Modi [35]. The common sense versus scientific methodology debated was put to rest for once and all, by none other than Einstein on December 1944 “I fully agree with you about the significance and educational

value of methodology as well as history and philosophy of science. So many people today—and even professional scientists—seem to me like somebody who has seen thousands of trees but has never seen a forest. Knowledge of the historic and philosophical background gives that kind of independence from prejudices of his generation from which most scientists are suffering. This independence created by philosophical insight is—in my opinion—the mark of distinction between a mere artisan or specialist and a real seeker after truth. (Einstein to Thornton, 7 December 1944, EA 61-574)”.

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