

## 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)”.

## References

- Thurston AJ. Art of preserving health: studies on the medical supervision of physical exercise. *ANZ J Surg.* 2009; 79: 941-945.
- Berryman JW, Park RJ. *Sport and Exercise Science: Essays in the History of Sports Medicine.* Publisher: University of Illinois Press. 1992; 90.
- Pavy FW. Report of Analyses of Urine during Severe Exercise in the Case of Mr. Weston. *Br Med J.* 1876; 1: 315-316.
- Agarwal BB, Chintamani, Agarwal S. Fast Track Surgery-Minimizing Side Effects of Surgery. *Indian J Surg.* 2015; 77: 753-758.
- Agarwal BB. Yoga and Medical Sciences. *JIMSA.* 2010; 23: 69.
- Anand BK. Yoga and medical sciences. *Indian J Physiol Pharmacol.* 1991; 35: 84-87.
- Tabona MV, Ambrosino N, Barnes PJ. Endogenous opiates and the control of breathing in normal subjects and patients with chronic airflow obstruction. *Thorax.* 1982; 37: 834-839.
- Cohen EE, Ejsmond-Frey R, Knight N, Dunbar RI. Rowers' high: behavioural synchrony is correlated with elevated pain thresholds. *Biol Lett.* 2010; 6: 106-108.
- Vassilakopoulos T, Hussain SN. Ventilatory muscle activation and inflammation: cytokines, reactive oxygen species and nitric oxide. *J Appl Physiol.* 2007; 102: 1687-1695.
- Sadja J, Mills PJ. Effects of yoga interventions on fatigue in cancer patients and survivors: a systematic review of randomized controlled trials. *Explore (NY).* 2013; 9: 232-243.
- Bower JE, Greendale G, Crosswell AD, Garet D, Sternlieb B, Ganz PA, et al. Yoga reduces inflammatory signaling in fatigued breast cancer survivors: A randomized controlled trial. *Psychoneuroendocrinology.* 2014; 43: 20-29.
- Rao RM, Telles S, Nagendra HR, Nagarathna R, Gopinath K, Srinath S, et al. Effects of yoga on natural killer cell counts in early breast cancer patients undergoing conventional treatment. Comment to: recreational music-making modulates natural killer cell activity, cytokines, and mood states in corporate employees Masatada Wachi, Masahiro Koyama, Masanori Utsuyama, Barry B. Bittman, Masanobu Kitagawa, Katsuiku Hirokawa *Med Sci Monit.* 2007; 13: 57-70. *Med Sci Monit.* 2008; 14: 3-4.
- Slomski A. Meditation Promotes Better Sleep in Older Adults. *JAMA.* 2015; 313: 1609.
- Corbin Winslow L, Shapiro H. Physicians want education about complementary and alternative medicine to enhance communication with their patients. *Arch Intern Med.* 2002; 162: 1176-1178.
- Henry J. Women in medicine: take control of your day--don't let your day take control of you. *Kidney Int.* 2009; 75: 249-250.
- Black DS, O'Reilly GA, Olmstead R, Breen EC, Irwin MR. Mindfulness meditation and improvement in sleep quality and daytime impairment among older adults with sleep disturbances: a randomized clinical trial. *JAMA Intern Med.* 2015; 175: 494-501.
- Black DS, Slavich GM. Mindfulness meditation and the immune system: a systematic review of randomized controlled trials. *Ann N Y Acad Sci.* 2016; 1373: 13-24.
- Pascoe MC, Bauer IE. A systematic review of randomised control trials on the effects of yoga on stress measures and mood. *J Psychiatr Res.* 2015; 68: 270-282.
- Desai R, Tailor A, Bhatt T. Effects of yoga on brain waves and structural activation: A review. *Complement Ther Clin Pract.* 2015; 21: 112-118.
- Kuntsevich V, Bushell WC, Theise ND. Mechanisms of yogic practices in health, aging, and disease. *Mt Sinai J Med.* 2010; 77: 559-569.
- Brown RP, Gerbarg PL. Yoga breathing, meditation and longevity. *Ann N Y Acad Sci.* 2009; 1172: 54-62.
- Babbar S, Shyken J. Yoga in Pregnancy. *Clin Obstet Gynecol.* 2016; 59: 600-612.
- Agarwal BB, Mahajan KC. Effect of yoga exercise on outcomes of stapled hemorrhoidectomy: result of a prospective randomised controlled study. *Surg Endosc.* 2008; 22: 150.
- Ungar E, Lie D. Yoga Effective Against Complications of Stapled Hemorrhoidectomy (Accredited CME Activity). *Medscape Medical News.* 2008.
- Dhamija N, Agarwal BB. Optimizing outcomes of colorectal surgery – The current perspectives. *Curr Med Res Pract.* 2016; 6: 69-78.
- Agarwal BB, Sharma S, Gupta MK, Sarangi R, Mahajan KC. Can Yoga Improve the Outcomes of Surgery for Haemorrhoids? A Prospective Randomized Controlled Study. *JIMSA.* 2012; 25: 37-40.
- Agarwal KA, Tripathi CD, Agarwal BB, Saluja S. Efficacy of turmeric (curcumin) in pain and postoperative fatigue after laparoscopic cholecystectomy: a double-blind, randomized placebo-controlled study. *Surg Endosc.* 2011; 25: 3805-3810.
- Agarwal N, Saluja S, Agarwal BB, Sharma S, Ali K, Goyal K, et al. Effect of continuing yoga practice on the adverse patient reported outcomes following stapled trans-anal resection of the rectum (STARR) for obstructed defecation syndrome (ODS). 2013 Scientific Session of the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES) Baltimore, USA, April 17- 20, 2013. *Surg Endosc.* 2013; 27: 309-033.
- Agarwal BB. Do dietary spices impair the patient-reported outcomes for stapled hemorrhoidectomy? A randomized controlled study. *Surg Endosc.* 2011; 25: 1535-1540.
- Davidoff F. We need better ways to create new hypotheses and select those to test. *BMJ.* 2012; 345: 7991.
- Agarwal BB. Journey of Carbon literate and climate conscious endosurgeon having Head, Heart, Hands & Holistic sense of responsibility. *Surg Endosc.* 2008; 22: 2539-2540.
- Agarwal BB. Informed consent-'da Vinci code' for our safety in empowered patient's safety. *Surg Endosc.* 2009; 23: 1158-1160.
- Kahol K, Satava RM, Ferrara J, Smith ML. Effect of short-term pretrial practice on surgical proficiency in simulated environments: a randomized trial of the "preoperative warm-up" effect. *J Am Coll Surg.* 2009; 208: 255-68.
- Agarwal BB, Chintamani, Mahajan KC. Prospective Randomized Controlled Trial to Study the Safety of a Parachute! Quo Vadis? Caveamus Medicus. Vest Deus Tecum? *JIMSA.* 2012; 25: 9.
- International day of yoga.