

## Response to comment on the article, “Yoga protocol for treatment of breast cancer-related lymphedema”

Dear Sir,

We welcome the suggestion by Loudon *et al.* that the currently available evidence of use of yoga in lymphedema affecting both upper and lower extremities should be enhanced by valid research and a valuable academic debate could now be beginning. Our paper explained how we used yoga and breathing as a self-care intervention for breast cancer-related lymphedema (BCRL).<sup>[1]</sup> We compared Loudon *et al.*, using yoga as an intervention for BCRL for ease of practice by patients and its alignment, with Foldi *et al.*'s principles of lymph drainage.<sup>[2]</sup> Loudon *et al.* adopted the yoga postures from Satyananda Saraswati's book, “Asana, Pranayama, Mudra Bandha.”<sup>[3]</sup> Although they do not name their methods of practicing postures as a “yoga protocol,” their methods section states that the study was based on their previous publication on the study protocol,<sup>[4]</sup> in which they called it a yoga intervention. There are multiple definitions of “protocol.” We prefer it as a “precise and detailed plan for the study of a biomedical problem or for a regimen of therapy.” The protocols are “instructions on what to do in particular circumstances. They are similar to guidelines but include less room for individual judgment. They are often provided for less experienced staff or for use in situations where eventualities are predictable.”<sup>[5]</sup> The yoga sessions in Loudon *et al.*'s practice included “documented breathing, physical postures, meditation, and relaxation techniques” according to the Satyananda Yoga tradition as explained in Table 1 of their article. There is consequently little room for individual judgment and practice has to be carried out as explained in the reference; hence, the yoga module used by Loudon *et al.* is named by us as a “protocol.” The module was initially published under the “study protocol” and the same methodology was followed while doing a randomized controlled trial.

Our study identified the yoga sequence to be practiced as self-care in BCRL.<sup>[1]</sup> It began with warm up, prolonged exercise with appropriate rests, and suitable education of training staff. There is growing evidence to support this kind of exercises in BCRL.<sup>[6]</sup> Table 1 of Loudon *et al.* lists 17 postures that are numbered from 1a to 17. We assumed that patients are advised to carry out this yoga in that sequence. More so, if given in digital video disc, patients are likely to follow the same sequence, unless instructed otherwise. We compared both methods of using yoga in Figure 5 of Narahari *et al.*<sup>[1]</sup> Detailed explanation of the postures carried out was not mentioned by Loudon *et al.*

instead they cited Satyananda Saraswati's book. We have adopted full descriptions of each practice of reference 3 of Table 3 from Loudon *et al.*

Although Loudon *et al.* did not describe the variations from Satyananda Saraswati in their study protocol/trial, they described variations adopted by Satyananda Saraswati in response to our article. Since there was no description of the variation, we compared our yoga protocol to their method of using yoga as described in the cited reference. For example, Satyananda Saraswati describes the initial position of *Marjari asana* (*Marjari* = cat) as *Vajra asana*, a sitting position. From the *Vajra asana* position, the person should rise while the buttocks and knees should be kept touching the floor. Then, the person should bend forward place the hands on the floor with the fingers facing anteriorly. The final position looks like a standing cat, hence named as *Marjari asana*. Loudon *et al.* changed this initial position to a standing cat. The yoga positions were developed by either mimicking the movements of animals (viz., backward bending in *Bhujanga asana* resembles the snake posture; *Bhujanga* = snake) or comparing the shape of the body in its final position (*Gomukha* [like cow's face] *asana*). The careful observation on movements of animals and analyzing the fitness thus obtained resulted in adaptation of that movement in yoga and named by that animal.<sup>[7]</sup> To the best of our knowledge, we did not find “standing cat *Marjari-asana-variation*” in any of the yoga traditions. The yoga has to be validated if it is modified. It is mandatory to describe each step of the initial position to final position if yoga is altered and needs to be validated. Swami Vivekananda Yoga Anusandhana Samsthana (S-VYASA-Yoga University) described the method for validation of yoga practices.<sup>[8]</sup> Loudon *et al.* described the variation of *Tadasana* by knee bending in the final position. This becomes *Druta Uttkata asana* (dynamic energy pose).<sup>[9]</sup> The final position of *Tadasana*<sup>[9]</sup> as per Satyananda Saraswati is arm and heels raised position with the body is balancing over toes.

Loudon *et al.* describes *Greeva sanchalana* variation as done in two positions, lying and sitting. Satyananda Saraswati's teachings and our yoga protocol based on Swami Vishnu-devananda's The Complete Illustrated Book of Yoga does not recommend the *Greeva sanchalana* in lying position, because the stage 4 of *Greeva sanchalana* requires 360° rotation of head. The *Greeva sanchalana* and *Skandha chakra asana* can be done easily in a sitting position.

The lying archer position is described in table one of the response as a variation of *Akarna Dhanurasana* of Satyananda Saraswati. We find it difficult to comprehend the ease of the archer's movement by lying or sitting in a chair. It is not clear in their response how they adopted Moseley *et al.*'s study<sup>[9]</sup> to Satyananda Saraswati tradition to achieve peripheral joint movement. Loudon's patients probably experienced difficulty in attaining the final position from day 1 due to the physical constraints such as pain and restricted shoulder movements. This is probably why they have introduced variations on the classical teaching. We did not make any variation from the classical description instead we developed alternative postures for each yoga as described in Table 2 of Narahari *et al.*<sup>[1]</sup> The alternative postures were weaned off when patient was able to do the actual yoga.

We adopted the yoga in our protocol to achieve systematic lymph drainage; first, achieving central lymph drainage (CLD) followed by peripheral lymph drainage (PLD) as in Foldi's technique.<sup>[3]</sup> Yoga was used as a self-care method for large number of lymphedema patients in India.<sup>[10]</sup> In Foldi's technique, CLD is prerequisite to achieve the PLD. If CLD is inadequate, and only PLD is adequate, treatment results in genital swelling.<sup>[11]</sup> In our previous publications covering over 2700 lower limb lymphedema patients, we have not come across genital swelling in lymphedema patients who are regularly continuing yoga. This is indirect evidence for lymph drainage. Exploring the research findings of different studies in "using yoga in BCRL,"<sup>[12]</sup> Loudon *et al.* identified several possible benefits from yoga that included lymphatic drainage, effect on immunity and the nervous system.<sup>[11]</sup> There is no definite objective evidence to show that yoga achieves systematic lymph drainage although several possible mechanisms were postulated.<sup>[13]</sup>

The authors are skeptical about the safety of the *Bhastrika pranayama*. *Bhastrika* along with other breathing exercises improved handgrip strength by decreasing sympathetic activity.<sup>[14]</sup> Improving hand grip is one of the outcome measures to determine the effect of yoga on BCRL by Fisher *et al.*<sup>[15]</sup> The yoga coach at our center always fills a chart to monitor if there are any sign or symptom of hyperventilation. We have not come across adverse events attributable to yoga so far in 15 years of using yoga for lymphedema.

Finally, we wish to comment on the study design of Loudon *et al.* They included 28 patients, and 9 patients in yoga and 10 in the control group completed the study. They have a few outcome measures for comparison at the end of the study. As stated in our article, ours is a qualitative study to design a yoga protocol for BCRL. Qualitative study is a prerequisite for quantitative research in biomedicine. We need to know if a treatment works before conducting

a randomized controlled trial. We had to develop, refine, and standardize the treatment components (details of yoga) through mutual orientation. Therefore, it was not appropriate to evaluate the protocol in a randomized trial as collective clinical "equipoise" was not present with standard treatments. We treated and analyzed the volume difference in eight BCRL patients in one group pre- and post-test design.<sup>[16]</sup> Since there were no established BCRL yoga protocols, our aim was to develop yoga and breathing as a self-care protocol for upper limb lymphedema and the physiological basis of yoga sequence to achieve maximum outcome. This protocol, however, needs to be put into trial in centers routinely managing BCRL.

As in our integrative medicine treatment, compression therapy was also the part of the treatment of Loudon *et al.* "The yoga intervention group was given a choice to wear a compression sleeve and if removed, instructed to wear it again immediately after the yoga session." Hence, the difference in volume is not only due to the yoga intervention but also due to the compression sleeves.

We intended to compare the ease and possible mechanisms of two yoga protocols. Our protocol was used in Grade 3 lymphedema, and this is also useful for other grades also.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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<b>DOI:</b> 10.4103/0973-6131.194571	

**How to cite this article:** Narahari SR, Aggithaya MG, Thernoe L, Bose KS, Ryan TJ. Response to comment on the article, "Yoga protocol for treatment of breast cancer-related lymphedema". *Int J Yoga* 2017;10:52-4.