

Letter to the Editor

## Heart rate variability following an integrative treatment consisting of Ayurveda, biomedicine, and yoga in patients with lymphedema

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**Quick Response Code:**



Dear Sir,

Lymphedema is a chronic, progressive and debilitating condition associated with persistent accumulation of protein-rich fluid in interstitial spaces leading to swelling of one or more parts of the body.<sup>[1]</sup> Lymph drainage may be facilitated by shifting the autonomic balance toward vagal dominance.<sup>[2]</sup> Yoga and Ayurveda are known to modulate autonomic activity. Previously, a treatment protocol integrating Ayurveda, biomedicine, and yoga was reported to be clinically useful in patients with lymphedema.<sup>[3]</sup> With this background, the present study was intended to (i) compare the heart rate variability (HRV) of patients with lymphedema with age- and gender-matched healthy volunteers and (ii) determine the effect of an integrative treatment on the HRV in patients with lymphedema.

Eleven patients with lymphedema (group mean age  $\pm$  S.D.;  $46.09 \pm 12.47$  years; m: f = 9:2) and (ii) 11 age (group mean age  $\pm$  S.D.;  $46.90 \pm 5.78$  years) and gender- (m: f = 9:2) matched healthy adults were assessed during a 5 min recording of HRV and breath rate (MP 45, BIOPAC System, U.S.A.). The patients received a treatment protocol integrating Ayurveda, biomedicine, and yoga for 10 days. The protocol includes washing of skin of the affected limb/limbs, *phanta* (=herbalised infusion) soaking, manual lymph drainage, and yoga practice. The study was approved by the Ethics Committee of the Institution (approval number: YRD - 019/006). The signed consent was obtained from each participant.

The EKG data were visually inspected offline and only noise-free data were included for analysis. Frequency domain measures (i.e., the low-frequency band [0.04–0.15 Hz] and (ii) high-frequency band [0.15–0.40 Hz]) and time-domain components (i.e., mean RR interval [the mean of the intervals between adjacent QRS complexes or the instantaneous heart rate], RMSSD [the square root of the mean of the sum of the squares of differences between adjacent NN intervals], NN50 [the number of interval differences of successive normal to normal intervals >50 ms] and pNN50 [the proportion derived by dividing NN50 by the total number of NN intervals]) of HRV were extracted using Kubios HRV software.<sup>[4]</sup> The respiration rate was determined as cycles per minute by averaging the breath rate in each 5 min state recorded at baseline and after 10 days.

The baseline data of patients with lymphedema and of normal healthy volunteers were compared using Mann–Whitney U test. The data obtained at baseline and after 10 days of integrative

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treatment were analysed using Wilcoxon sign rank test. RMSSD was significantly lower ( $P < 0.05$ ; one-tailed) in patients with lymphedema compared to normal healthy volunteers. RMSSD reflects vagal activity.<sup>[5]</sup> This suggests that patients with lymphedema may have lower cardiac vagal activity compared to age- and gender-matched normal healthy volunteers. Following 10 days of integrative treatment, the LF/HF ratio decreased significantly ( $P < 0.05$ ; one-tailed). LF/HF ratio is an index of sympathovagal balance. Higher values of the index suggest sympathetic dominance. Hence, a decrease in LF/HF ratio after 10 days of integrative treatment suggests a shift in autonomic activity toward vagal dominance in patients with lymphedema. This may explain the clinically beneficial effects of the integrative treatment reported in the previous studies.<sup>[3]</sup> The findings may also be extended to cases of lymphedema following oncological lymphadenectomy.

#### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

#### Conflicts of interest

There are no conflicts of interest.

#### REFERENCES

1. Borman P. Lymphedema diagnosis, treatment, and follow-up from the view point of physical medicine and rehabilitation specialists. *Turk J Phys Med Rehab* 2018;64:179-97.
2. Live Healthy Naturally. How to Improve Lymph Drainage. Available from: <https://healthorganicliving.com/blog/how-to-improve-lymph-drainage> [Last accessed on 2021 Dec 10].
3. Narahari SR, Ryan TJ, Mahadevan PE, Bose KS, Prasanna KS. Integrated management of filarial lymphedema for rural communities. *Lymphology* 2007;40:3-13.
4. Tarvainen MP, Niskanen JP, Lipponen JA, Ranta-Aho PO, Karjalainen PA. Kubios HRV--heart rate variability analysis software. *Comput Methods Programs Biomed* 2014;113:210-20.
5. DeGiorgio CM, Miller P, Meymandi S, Chin A, Epps J, Gordon S, *et al.* RMSSD, a measure of vagus-mediated heart rate variability, is associated with risk factors for SUDEP: The SUDEP-7 inventory. *Epilepsy Behav* 2010;19:78-81.

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