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Opinion

Can Yoga Breathing / Pranayama Concepts Be Reasonably Extended to Conventional Endurance Training?

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Yoga breathing practice, also known as pranayama, is the art of intentionally controlling the breath. Pranayama consists of numerous breathing techniques that affect the central nervous system. There are numerous benefits of practicing pranayama including improved pulmonary function [1], reduced oxygen consumption per unit work [2], and increased parasympathetic activity and decreased sympathetic dominance [3]. Several of these techniques focus on the use of a nasal breathing approach resulting in a slower diaphragmatically dominated breathing process which induces relatively greater parasympathetic activation and results in a lower rate of ventilation. The conventional breathing approach used by most individuals who engage in typical endurance exercises, such as running or cycling, is orally dominated, results in more rapid breathing, induces greater use of the chest respiratory muscles, and produces relatively higher rates of ventilation. The oral breathing approach reflects the common, but not evidentiary, wisdom that more ventilation provides greater oxygenation. However, recently emerging research on the topic brings question to this most basic belief [4].

While it has been demonstrated experimentally that ordinary subjects will be limited in their ability to produce peak work and oxygenation when they attempt to do so by breathing nasally [5], we now understand that the limitation to do so is not inherently because of the idea that nasal breathing reduces ventilation. Rather, the slower rate of breaths taken during nasal breathing increases the amount of carbon dioxide released with each breath which initially results in air hunger (the sensation of not getting enough air) in those not adapted to breathing in this way [6]. However, with time and gradual exposure it appears that endurance training practitioners interested in breathing nasally can gradually adapt to do, probably by downregulating their response to carbon oxide [6]. In translation, this means the sense of air hunger disappears with regular exposure. Most practitioners of yoga who utilize a slower nasal breathing approach will likely be familiar with this concept, having experienced some air hunger at first as they begin to implement this way of breathing in either yogic practice or meditation.

It is often said that one can attempt to do endurance exercise breathing nasally but that they will never be able to work “hard” while doing so. Our study on this topic [4]suggests that this is not true, as subjects who had practiced nasal breathing during endurance running for at least six months were able to produce the same peak work and oxygenation (VO2max) while breathing nasally as they were able to do while breathing orally.

In addition, the improved activation of the diaphragm, a muscle which not only facilitates more efficient breathing but also enhances functional movement ability as a key stabilizer of the trunk [7] may also then serve to make endurance practitioners less vulnerable to injury and able to perform better by improving their movement quality [8].

In our estimation, this means that the same basic breathing practices taught in yoga practice can be reasonably extended to

those practitioners who would also like to experience similar benefits while engaged in most forms of endurance exercise. In so doing, one can turn a form of exercise which is most often strongly sympathetically activating and relatively challenging to perform into an activity which is relatively more relaxed, meditative and enjoyable. Further, the potentially damaging effects of high rate ventilation through mouth are mitigated by using the lower rates of ventilation and the natural filtering, humidifying, temperature regulating and detoxifying apparatus of the nasal cavity. The scientifically demonstrable benefits of such a breathing approach include the prevention/treatment of exercise induced bronchoconstriction [9], an improved breathing efficiency and an improved physiological economy (lower energy cost) [6]. Speculatively, it is also thought that a nasal breathing approach during exercise may help to reduce the occurrence of respiratory infections, improve concentration, and improve coronary artery blood flow. All that is really needed to achieve this approach is central to yogic practice – consistency of application and the patience to realize the benefits.

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Conflict of Interest

No conflict of interest.

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