Immediate Effects of Slow Pace Bastrika Pranayam on Blood Pressure and Heart Rate

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Objectives: The study was conducted to evaluate the immediate effect of slow pace bhastrika pranayama (respiratory rate 6/min) for 5 minutes on heart rate and blood pressure. Subjects and methods: Heart rate and blood pressure of volunteers (n= 39, age = 25–40 years) was recorded following standard procedure. First, subjects had to sit comfortably in an easy and steady posture (sukhasana) on a fairly soft seat placed on the floor keeping head, neck, and trunk erect, eyes closed, and the other muscles reasonably loose. The subject is directed to inhale through both nostrils slowly up to the maximum for about 4 seconds and then exhale slowly up to the maximum through both nostrils for about 6 seconds. The breathing must not be abdominal. These steps complete one cycle of slow pace bhastrika pranayama (respiratory rate 6/min). During the practice the subject is asked not to think much about the inhalation and exhalation time, but rather was requested to imagine the open blue sky. The pranayama was conducted in a cool, well-ventilated room (18–20°C). After 5 minutes of this breathing practice, the blood pressure and heart rate again were recorded in the aforesaid manner using the same instrument. The other group (n =10) took part in another study where their blood pressure and heart rate were recorded following half an hour of oral intake of hyoscine-\(\text{N}\)-butylbromide 20 mg. Then they practiced the breathing exercise as stated above, and the above mentioned parameters were recorded again to study the effect of parasympathetic blockade on the same pranayama. Results: It was noted that after slow Bhastrika pranayamic breathing for 5 minutes, both the systolic and diastolic blood pressure decreased significantly with a slight fall in heart rate. No significant alteration in both blood pressure and heart rate was observed in volunteers who performed the same breathing exercise as stated above, and the above mentioned parameters were recorded again to study the effect of parasympathetic blockade on the same pranayama. Discussion: Pranayama increases frequency and duration of inhibitory neural impulses by activating pulmonary stretch receptors during above tidal volume inhalation as in Hering Buer reflex, which bring about withdrawal of sympathetic tone in the skeletal muscle blood vessels, leading to widespread vasodilatation, thus causing decrease in peripheral resistance and thus decreasing the diastolic blood pressure. After hyoscine-\(\text{N}\)-butylbromide, the parasympathetic blocker, it was observed that blood pressure was not decreased significantly as a result of pranayama, as it was observed when no drug was administered.

Conclusions: Vagal cardiac and pulmonary mechanisms are linked, and improvement in one vagal limb might spill over into the other. Baroreceptor sensitivity can be enhanced significantly by slow breathing (supported by a small reduction in the heart rate observed during slow breathing and by reduction in both systolic and diastolic pressure). Practice of slow pace bhastrika pranayama thus shows a strong tendency to improve the autonomic nervous system function through enhanced activation of the parasympathetic system.

Key words: slow pace bhastrika pranayama, parasympathetic system.