

Pranayama and hypertension: Need for investigation

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Abstract

Hypertension is an important and growing public health challenge worldwide. Though various studies have been conducted to study effect of particular type of *pranayama* on hypertension, a combination of various techniques has not been evaluated in this regard. Present study was thus carried to compare levels of hypertension in patients practicing *pranayama* and those who are not. The experimental group practiced a specially designed *pranayama* module of practical *Pranayama* for mild hypertension under expert supervision. Weight and blood pressure of all the patients were measured at the beginning and at the end of every month.

Though the average blood pressure increased with respect to increase in physical activity, the difference was not statistically significant in cases and controls.

Qualitative analysis of reviews of participants recorded after the completion of workshop revealed that all of them felt relaxed and energized after practice of *pranayama*. Better control over anger was also mentioned by two participants. All of them said that they will continue to practice of *pranayama*.

Present study noted that the regular practice of yoga and *pranayama* can be helpful in relaxing the mind of practitioners, thereby making them feel better which, in turn, may prove to be helpful in reducing blood pressure over a period of time.

Keywords: Blood pressure, Hypertension, *pranayama*.

Introduction

Hypertension, a “psychological classical silent killer” is the hallmark of various cardiovascular disorders.¹ High blood pressure is present in more than one billion adults worldwide and is the most important modifiable risk factor of death resulting from cardiovascular disease.² A review of 142 articles suggests that 33% urban and 25% rural Indians are hypertensive.³ Due to plenty of etiological factors, Hypertension is an important and growing public health challenge worldwide. Left untreated it can quietly damage the body for years before symptoms develop.

Various researchers have studied role of life style modification to control hypertension. Out of these most widely studied is effect of *Pranayama* on respiratory, cardio-vascular and other functions.⁴ For example, Bhavanani et al., have studied immediate effect of *Sukha Pranayama* and *Chandra Nadi Pranayama*.^{5,6}

Pranayama, a branch of yoga practice, is claimed to be extremely beneficial to Mankind in maintaining sound physical and mental health. It is found to be effective for physiology of mankind in many ways. *Maharshi Patanjali*, in his *Ashtanga Yoga*, has given more importance to *pranayama* than *asana* for good health.⁷ The Sanskrit word *Pranayama* contains two segments namely *Prana* (means vital force or energy) and *Yama* (means control).⁸ It means, *pranayama* is an act performed for controlling the flow of vital energy that governs all the physiological processes in the body. The main aim is to attain the unity of mind, body and spirit through *asanas* (muscle exercises), *pranayama* (breathing exercises), and meditation.⁹

Though various studies have been conducted to study effect of particular type of *pranayama* on hypertension, a combination of various techniques has not been evaluated in

this regard. Present study was thus carried with the following objectives:

1. To evaluate reduction in hypertension in patients who will be practicing *Pranayama* daily.
2. To compare levels of hypertension in patients practicing *pranayama* and those who are not.

Material and Methods

It was an experimental study design carried over a period of three months. Study population consisted of patients who are detected for hypertension and are taking regular treatment for it for the preceding 2 months at Medicine OPD and /or Urban Health Centre of a medical college, in Maharashtra. People above 60 years of age and those suffering from Cardiovascular/ lung problems, ANC and PNC were excluded from the study. Patients were matched for age and status of hypertension for experimental and control group after obtaining their consent

Experimental group was trained in *pranayama* module of practical *Pranayama*, designed for controlling mild hypertension, by two Yoga experts of Kaivalyadhama.

It consisted of 5 min. rest followed by 5 min. Breathing awareness, 20 rounds of *Anuloma-viloma Pranayama*, 20 rounds of *Sitkari* followed by 5 min. rest in the form of *Shavasana*. It was to be practiced individually everyday between 10 am to 11 am at urban health. In order to ensure correct procedure, the program was done as a group activity, under the guidance of a certified yoga teacher on alternate days. The control group was asked to follow their routine activity.

Patients from both the groups continued their regular treatment. B.P. was measured every month using

sphygmomanometer. Demographic and clinical information was collected using a structured Questionnaire.

Results

Study population consists of patients who were on regular treatment of hypertension. Of this 40 were included in the study after obtaining their consent. These patients were allotted to control and case groups after matching for sex, age and severity of disease. Final analysis was done for 17 patients who regularly followed the *pranayama* schedule for a continuous period of twelve weeks. Thus final group of cases included 8 males and 9 females in the age group $60.8\text{yr} \pm 8\text{yr}$ and the control group consisted of 10 males and 10 females in the age group of $60.3\text{ yr} \pm 7\text{yr}$. Duration of disease ranged from 6 months to 28 years.

Three patients in each group reported no physical activity, whereas 11 in each group reported to have a mild physical activity (Fig. 1).

Intake of salty food like pickle and /or papad was also noted. (Fig. 2).

It was observed that the cases and controls were comparable with respect to physical activity. Weight and blood pressure of all the patients were measured at the beginning and at the end of every month. Similarly, systolic and diastolic blood pressure was measured at the end of every month. Results are summarized in table 1. On applying Wilcoxon sign rank test, it was observed that there was no difference in the baseline average systolic blood pressures of cases and controls ($Z= 2.55, p=0.22$).

It was observed that though there was decreasing trend of systolic blood pressure (SBP) among cases, the difference between initial SBP and the consecutive readings was not statistically significant. Similarly, the SBP of cases and controls were found to be comparable at all time points.

Further analysis was done to find whether blood pressure differed with respect to activity in cases and controls (Table 2)

It was observed that though the average blood pressure increased with respect to increase in physical activity, the difference was not statistically significant in cases and controls.

Qualitative analysis of reviews of participants recorded after the completion of workshop revealed that all of them felt relaxed and energized after practice of *pranayama*. Better control over anger was also mentioned by two participants. All of them said that they will continue to practice of *pranayama*.

Discussion

Yoga is an ancient Indian science that designs way of life with its various practices. It is being practiced in the form of *Asana* (Posture), *Pranayama* (breathing manipulation), Meditation (concentration technique) etc by the practitioners in range of methods and style.¹⁰

There are many benefits for *pranayama* and there have been many studies conducted experiments on these benefits. Kuppaswamy et al, on the basis of a systematic review of 6 studies of *Bhramari pranayama*, concluded that it

influences multiple systems in the body and there is definitely a scope to have desirable effects on respiratory system, autonomic nervous system, as well as, on stress & anxiety levels and over all other emotional states of the practitioner.¹¹

In an experimental study, Yadav RC noticed significant decrease in systolic and diastolic blood pressure, after 12 weeks of practice of *Pranayama*.¹²

Most of the studies have seen the effect of *Bhramari Pranayama*, which is a slow breathing exercise, for 5 minutes on heart rate and blood pressure.¹³

Aashish Chaddha, while exploring the cardiovascular and blood pressure lowering benefit of *Pranayama*, further suggests it is plausible that a prescription of yoga, or *Pranayama* in itself, in addition to pharmacotherapy, may be even more effective in primary and secondary cardiovascular disease prevention and risk factor modulation than pharmacological intervention alone. He has noted that practice of *pranayama* benefits mental health and thus have impact on non-traditional cardiovascular risk factors, such as anxiety, depression, hostility, anger, and overall stress which, in turn, has effects on blood pressure.¹⁴ R Goyal et al., also observed that *pranayama* produces relaxed state and in this state parasympathetic activity overrides sympathetic activity. They also suggested that the addition of *pranayama* can be a useful adjunct to antihypertensive drugs for better control of mild hypertension in hypertensive.¹⁵

Though the present study did not find significant change in blood pressure of those who practiced *pranayama* and those who did not, the feel-good factor was mentioned by all those practicing *Pranayama*.

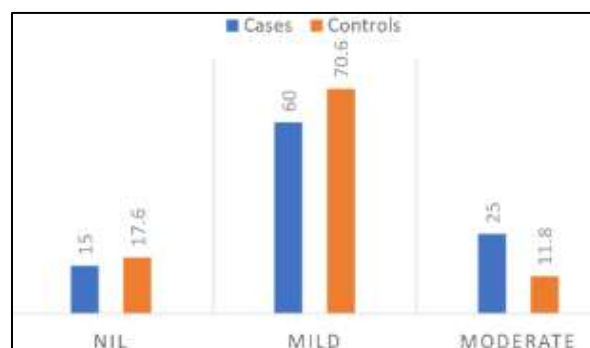


Fig. 1: Physical Activity

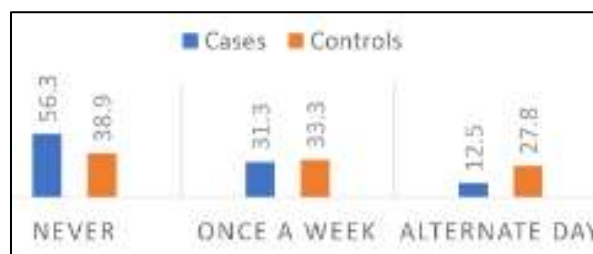


Fig. 2: Distribution of salty food

Table 1: Average blood pressure at the end of each month

	Cases	Controls		Cases	Controls
SBP1	131.9 ± 16.3	138.9 ± 11.8	DBP1	79.3 ± 5.4	85.6 ± 9.3
SBP2	129.4 ± 8.7	131.5 ± 13.4	DBP2	77.3 ± 7.3	86.0 ± 10.5
SBP3	129.7 ± 14.4	132.6 ± 14.7	DBP3	79.3 ± 7.1	84.8 ± 9.1
SBP4	127.69 ± 8.3	133.0 ± 16.3	DBP4	82.0 ± 4.6	83.6 ± 9.8

Table 2: Average SBP with respect to physical activity

	Cases	Controls
Nil	116.66 ± 11.5	136.0 ± 10.4
Mild	134.33 ± 16.7	139.6 ± 12.8
Moderate	140.0 ± 0	138.8 ± 12.1
Kruskal Wallis	3.6, p < 0.16	0.52, p < 0.77

The reason for not observing significant change, in practitioners and non-practitioners of *pranayama* may be probably because of the nature of study population who was from semi-urban middle income group, where the life style changes, that might have offset the effect of yoga and *Pranayama*. None of the previous studies have mentioned the socio-economic background of the population which may be an important confounding factor.

Another important reason for not observing change in blood pressure may be because the present study has tried to explore the effect of a set of yoga and *pranayama* exercises, instead of concentrating only on *Bhramari Pranayama*.

Conclusion

Present study noted that the regular practice of yoga and *pranayama* can be helpful in relaxing the mind of practitioners, thereby making them feel better which, in turn, may prove to be helpful in reducing blood pressure over a period of time. However, no significant change in blood pressure was noticed among practitioners and non-practitioners of *pranayama* in the present study. There is a scope for controlled trials to investigate the relevance of yoga in reducing hypertension. Favorable subjective expressions, of the study group, raise a hope that these participants might have continued the practice even after the study period.

Limitations: Stress level, of study population, was not clinically measured in the present study.

Conflict of Interest: None.

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