

## **The Effectiveness of Yoga Practicing on Blood Pressure and Some Physiological Indexes of Patients with Stage 1 Hypertension**

**Hung Manh NGUYEN<sup>1</sup>, Khue Ai Thi HOANG<sup>1,2</sup>**

<sup>1</sup> Faculty of Sport and Physical Education, Vinh University, 182 Le Duan, Vinh city, VIETNAM

<sup>2</sup> Manager of Yoga Ban Mai Center, Vinh city, VIETNAM

**Email:** [hungtdt@gmail.com](mailto:hungtdt@gmail.com), [hoangtaikhue@gmail.com](mailto:hoangtaikhue@gmail.com)

*Type: Research Article (Received: 26.12.2017 – Corrected: 27.01.2018 – Accepted: 27.01.2018)*

### **Abstract**

Hypertension is a major public health issue affecting millions of people around the world and is also a major risk factor for stroke, cardiovascular and chronic kidney disease. Lifestyle modifications have been recommended as a first line approach for both prehypertension and stage 1 hypertension. Yoga had been shown to be one of the most popular therapies in older hypertensive patients. This study is carried out with controlled trial of yoga practice. After 12 weeks of yoga training, the results show that systole of yoga group decreased 13.1 mmHg and diastole of yoga group decreased 6.2 mmHg. Indicators such as BMI, Waist significantly decreased ( $p < 0.001$ ). Cholesterol and Triglyceride also significantly decreased ( $p < 0.05$ ). There is no change for HDL – C and LDL – C.

**Keywords:** Blood pressure, Hypertension, Yoga

## Introduction

Hypertension is one of the most common diseases in the world, affecting approximately 26% of the adult population (Kearney et al., 2005). Hypertension is also known as high blood pressure, is a long-term medical condition in which the blood pressure in the arteries is persistently elevated (Naish & Court, 2014). Long-term high blood pressure; however, is a major risk factor for coronary artery disease, stroke, heart failure, peripheral vascular disease, vision loss, and chronic kidney disease (Lackland and Weber, 2015; Mendis et al., 2011). Lifestyle changes and medications can lower blood pressure and decrease the risk of health complications. Lifestyle changes include weight loss, decreased salt intake, physical exercise, and a healthy diet (Poulter et al., 2015). Modern medicines can treat hypertension but in the long run they have side – effects (Vogel, 1992).

Previous studies have also shown that yoga may reduce blood pressure (Cade et al., 2010; Cohen et al., 2011; Mourya et al., 2009). The current study provides further evidence about the usefulness of Yoga in treating hypertension.

## Materials and Methods

### *Participants*

This study was carried out on 29 hypertensives at stage 1. Patients were examined to have hypertension at stage 1 at Cardiology Department, Vinh city hospital, and not ever use any dose for hypertension treatment.

*Inclusion criteria:* Patients aged 30-64 and not using any dose of hypertension treatment and any drugs that affect blood pressure (such as corticoid). Participants are non-smoker and volunteer to consent to study.

*Exclusion criteria:* Patients with hypertension have complication of heart, kidney, eyes, and peripheral blood vessels. Not capable to practice yoga and not on a diet. Participate in 90 percents of yoga sessions.

### *Design*

This is a pre and post study. Intervention group practiced 70 minutes/day and 3 sessions/weeks including meditation (10 minutes), breathing exercise (10 minutes), Yoga gentle (30 minutes), laughing yoga (10 minutes), yoga nidra (10 minutes).

Blood pressure is determined by sphygmomanometer. Anthropology: for measuring height, weight, waist, BMI. Triglyceride, cholesterol, LDL-C, HDL-C are determined by Automatic Biochemistry Machine Hitachi 704.

### *Statistical analysis*

Pre and post comparison was used to assess the differences among phases of study.  $P < 0.05$  was considered to be statistically significant. Epi Info software was used to analyse data.

## Results

### *Characteristics of study sample*

The average age of research sample is  $54.8 \pm 4.1$ ; including 6 males and 24 females. There are 6 people have salty food daily (appro. 20%); nobody stays up late after 23 o'clock.

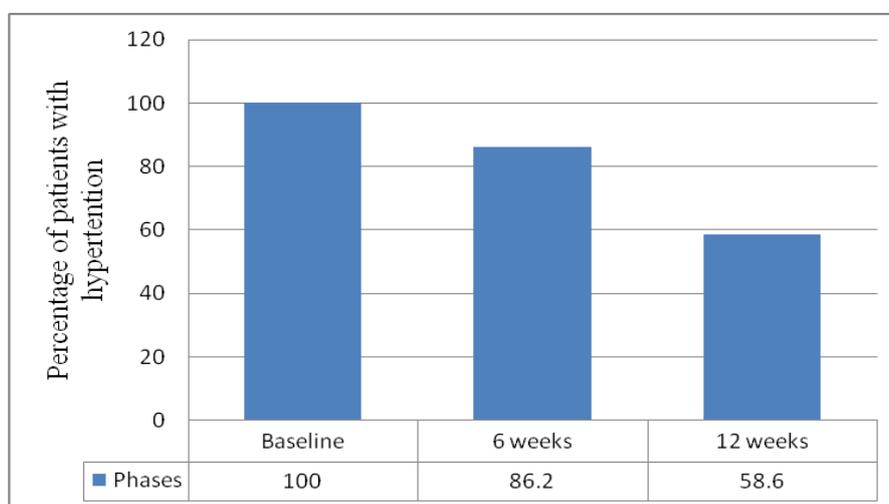
### Effectiveness of yoga practicing on blood pressure

Systole and diastole were checked in the early mornings at different phases of study. The results are indicated in table 1.

**Table 1.** Effectiveness of yoga practicing on blood pressure

Indexes	Phases				
	Baseline (0)	After 6 weeks (6)	After 12 weeks (12)	(12) – (0)	P <sub>0-6; 0-12</sub>
Systole (mmHg)	151.2± 8.4	146.5 ± 7.5	137.1 ± 6.9	-13.1	<0.001
Diastole (mmHg)	90.6 ± 6.2	88.1 ± 4.7	84.4 ± 4.5	- 6.2	<0.001

Results in table 1 showed that after 6 weeks of yoga practicing, systole and diastole of patients with hypertension decreased significantly; systole decreased 13.1 mmHg and diastole decreased 6.2 mmHg ( $p < 0.001$ ).



**Chart 1.** Rate of hypertensives at different phases of study

There were 100% of patients with hypertension at the baseline, however after 6 weeks of yoga practice, the rate of hypertensive decreased to 86.2%, and 58.6% after 12 weeks (chart 1).

### Effectiveness of yoga practice on some physiological indexes

**Table 2.** Effectiveness of yoga practicing on some morphological indexes

Phases	Weight (kg)	BMI	Waist (cm)
Baseline (0)	61.6 ± 5.9	23.7 ± 3.4	84.4 ± 5.6
Afer 6 weeks (6)	60.2 ± 5.5	23.2 ± 1.7	82.9 ± 4.5
Afer 12 weeks (12)	58.4 ± 4.6	22.5 ± 1.4	80.3 ± 4.4
P <sub>0-6; 0-12</sub>	>0.05; <0.001	>0.05	<0.05; <0.001

The results in table 2 showed that after 6 weeks and 12 weeks of yoga training, weight and waist of hypertensives decreased significantly in comparison with baseline ( $p < 0.001$ ). BMI reduced but no significance ( $p > 0.05$ ).

**Table 3.** Effectiveness of yoga practicing on some physiological indexes

Phases	Cholesterol (mmol/l)	Triglycerid (mmol/l)	HDL-C (mmol/l)	LDL-C (mmol/l)
Baseline (0)	6.6 ± 2.3	2.6 ± 1.1	1.1 ± 0.5	3.5 ± 1.2
Afer 6 weeks (6)	6.1 ± 2.6	2.4 ± 1.3	1.3 ± 0.9	3.2 ± 1.6
Afer 12 weeks (12)	5.3 ± 2.0	2.0 ± 0.8	1.4 ± 0.6	3.0 ± 1.4
P <sub>0-6; 0-12</sub>	>0.05; <0.01	>0.05; <0.05	>0.05	>0.05

The results in table 3 indicated that after 6 weeks of yoga practicing, blood lipids indexes such as cholesterol, triglyceride, LDL-C decreased and HDL-C increased but no statistical significance. Cholesterol decreased significantly with  $p < 0.01$ , triglyceride also decreased with  $p < 0.005$ . There is no significant reduction for HDL-C and LDC-C.

### Discussion and Conclusion

The aim of this study was to assess the effectiveness of yoga exercise on hypertension and some indexes involve hypertension. The results of the study showed that after 12 weeks of yoga training (gentle yoga, meditation, laughing yoga, breathing yoga, and yoga nidra contributed to hypertension treatment

Previous findings suggested that yoga exercises may be beneficial for reducing triglyceride, cholesterol, LDL in patients with diabetes (Shantakumari and Sequeria, 2013), reducing stress, cholesterol (Mandape et al., 2015). Another prior study was an 8-week pranayama and asana yoga program conducted in 27 untreated hypertensive patients and 27 controls living in Thailand, the intervention group showed a significant reduction in systole blood pressure by 25mmHg at 8 weeks compared to 2mmHg increased in the control group (McCaffrey et al., 2005). In another finding suggested that yoga program has positive effect on hypertensive patients and on set-rated quality of life. Yoga practicing may be useful as a supplementary blood pressure therapy in addition to medical treatment when prescribed by primary care physicians (Wolf et al., 2013). The author of another study observed that after 12 weeks of yoga training the systolic blood pressure decreased 10 mmHg (Bagga and Gandhi, 2005).

This finding, to some extent, is consistent with results of the previous study that yoga improved hypertension (Murugesan et al., 2000), systolic blood pressure (Wolf et al., 2013), blood pressure (Cohen et al., 2011). However, added to this study, next study may be focused on effects of yoga on patients with chronic diseases.

To conclude, after 12 weeks of yoga training, blood pressure of patients with hypertension at stage 1 decreased significantly. Yoga may have a contribution to hypertension treatment.

### Conflict of Interest

The authors have not declared any conflicts of interest.

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