Effect of Cupping Therapy versus Continuous Aerobic Exercise on Lipid Profile in Hypertensive Men

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ABSTRACT

Blood pressure and lipid profile are strongly linked to function, particularly in patients with hypertension disease (HTN). That study was aimed to differentiate between the cupping therapy and continuous aerobic exercise effect on lipid profile in hypertensive men. Thirty volunteers male patient with primary hypertension selected from outpatients Desouk general hospital. Their age ranged between 40-50 years, they were divided into two equal groups: group (A) attended a program of cupping therapy one time per month for three months and group (B) attended a program of continuous aerobic exercise on a treadmill for 30 minutes, two times per week for three months. Analysis of the results revealed that there was a major decrease in blood pressure (systole and diastole) and lipid profile (Triglyceride LDL, and Total Cholesterol) and increase in HDL during the cupping therapy closely same continuous aerobic exercise. A major decrease post treatment compared with that pre-treatment (p > 0.05) in both groups, but there was no major difference between both groups (A, B) in pre-treatment and also post treatment (p > 0.05). Both cupping therapy, as well as continuous aerobic exercises, showed a significant decrease in blood pressure and lipid profile (Total Cholesterol, Triglyceride and LDL) and a significant increase in HDL post-treatment compared with that pre-treatment.

INTRODUCTION

Cupping therapy is an ancient treatment that can be used in several different ways. Wet cupping and dry cupping are the two main forms of cupping. The skin is drawn into the cup by negative pressure at dry cupping. In wet cupping, they also create negative pressure on the skin but with lacerations in that region that allow the dermal microcirculation of blood to draw into the cup (Lee et al., 2011). The word “Hijama” in Arabic means “sucking”. In the Persian Gulf, it was used not only for treatment but also for prophylaxis against diseases. It was found to be very powerful against dizziness (Guo, 2004).

Hypertension is a chronic condition in which blood pressure in the arteries is elevated. Blood pressure is expressed in the arterial system by means of two measurements, the systolic and diastolic pressures, which are the maximum and minimum. The systolic pressure happens when the left ventricle contracts the most; the diastolic pressure occurs when the left ventricle is most relaxed before the
next contraction. Normal blood pressure at rest is within the range of 100–140 mmHg and 60–90 mmHg, systolic and diastolic. Hypertension occurs when blood pressure persistently reaches 140/90 millimetres (Weber and Lackland, 2015).

Aerobic means were related to, requiring or required free oxygen and refer to the use of oxygen during exercise to sufficiently satisfy the energy demands of aerobic metabolism (James et al., 2014).

**Study design**
The current study had data about the lipid profile and BP of male patients with HTN. Patients signed an informed consent form before their engagement which has been attached. Research length was three months. The research has been accepted by the Faculty of Physical Therapy ethical committee, University of Cairo.

**METHODOLOGY**

**Participants**
Thirty male patients with primary hypertension stage I (mild =140-160 mmHg systole and 90-100 diastole) was involved in this analysis with age ranged 40 to 50 years. They were recruited from the outpatient Desouk general hospital. The data of BP was collected in a physical therapy clinic and the data of the lipid profile collected by three analytical laboratories. Data were collected for four times, once before the treatment programme and three times every month for three months.

**Inclusion criteria**
Medication allowed: ACE inhibitor and Angiotensin receptor blockers (ARBs) and all patients were aware of all procedures.

**Exclusion criteria**
If patient performed wet cupping or dry cupping during the past 6 months, Patients with secondary hypertension, Stage II and stage III hypertension (moderate ≥160/100 mmHg to sever ≥180/110 mmHg or more and Patient who associated with clinical conditions which are: renal disease, heart disease, cerebrovascular disease, diabetes, or advanced retinopathy.

**Group (A)**
Fifteen patients were applied to wet cupping therapy one time per month for three months.

**Group (B)**
Fifteen patients were applied continuous aerobic exercise (walking) on the treadmill for thirty minutes two times per week for three months.

**Equipment and Procedures**

**For evaluation**
Laboratory instruments by using lipid profile to measure (TG, TC, HDL and LDL) once before starting treatment programme and at the end of every month for three months. The test comprises four main parameters: total cholesterol, LDL cholesterol, HDL cholesterol and triglycerides. It is usually done in a fasting blood specimen. Fasting means full dietary restriction for 12–14 hours overnight, with the exception of water and medication (Mcardle et al., 2006). Mercury Sphygmomanometer and stethoscope used to measure BP also once before starting the treatment programme and at the end of every month for three months.

**For treatment**

**Wet cupping tools**
Each cup is fitted on the crown where an air removal suction device is mounted. Suction cups are compact, break-resistant, secure and the suction force can be easily controlled with very simple adjustments. For through patient, wet cupping applied about 8-10 cups of the general body on the back. Wet cupping, also known as bloodletting, happens when the skin area where the cup is located with a particular lancet shape has an incision about 1.5 ml deep by 1.5 ml long. The cupping is accomplished by creating a vacuum in the cup that is placed on the skin either by placing a heated cup on the skin that absorbs the air inside (fire cupping) or by using a suction pump (suction cupping).

**Treadmill** (Profit treadmill Model: DK16)
The exercise program includes warming-up, main exercise and cooling –down. Warming-up: Low intensity exercise in the form of stretching exercise and range of motion exercises combined with breathing exercises was included for five to ten minutes. Main exercise: It was walking on a treadmill with an individual maximum heart rate for 30 minutes. Cooling down: It has been immediately after every exercise session and was continuing for five to ten minutes using the same types of activities that have been performed during the warming up.

**RESULTS AND DISCUSSION**
Significance level at 0.05, all of the dependent variables included in this study indicate that the population is normally distributed for all of the variables, which enables the researcher to perform a MANOVA tests under the normality assumption valid. According to the Box test of equality of covariances across the groups indicates homogeneity since the F-test
Effects on LDL Level

No significant differences (P>0.05) in LDL (Table 2) between group A and group B within each Lab. However, LDL (Table 2) significantly differences among 3 labs within group A (P=0.01 and P=0.0001, respectively) and group B (P=0.01 and P=0.0001, respectively). However, no significant differences (P>0.05) were observed (Table 1) in diastolic and systolic blood pressure mean values within each month and overall mean values also, between group A and group B.

Effects on Total Cholesterol Level

No significant differences (P>0.05) in total cholesterol level (Table 2) between group A and group B within each Lab. However, total cholesterol level (Table 2) significantly differences among 3 labs within group A (P=0.0001; P<0.05) and group B (P=0.001; P<0.05). Lab 3 recorded the lowest value of total cholesterol in groups A and B compared to Lab 1 and Lab 2. Post-hoc test of total cholesterol level means differences (Table 3) between each pairwise of labs showed no significant differences between each pairwise of labs in group B. Still, there was a significant difference in group A between Lab 2 versus Lab 3 and no differences between Lab 1 versus Lab 2 and between Lab 1 versus Lab 3.

Effects on Triglyceride Level

No significant differences (P>0.05) in triglyceride (Table 2) between group A and group B within each Lab. Also, no differences (P>0.05) were observed in triglyceride among 3 Labs within each group.

Effects on HDL Level

No significant differences (P>0.05) in HDL (Table 2) between group A and group B within each Lab. However, HDL (Table 2) significantly differences among 3 labs within group A (P=0.045; P<0.05) and group B (P=0.047; P<0.05). Lab 3 recorded the highest value of HDL in groups A and B compared to Lab 1 and Lab 2. Post-hoc test of HDL mean differences (Table 3) between each pairwise of labs showed there were significant differences between Lab 2 versus Lab 3 in group A and group B, but no differences between Lab 1 versus Lab 2 and between Lab 1 versus Lab 3.

Effects on Diastolic and Systolic Blood Pressure

Regular physical activity lowers blood pressure, and existing American and European guidelines on hypertension are commonly recommended. Hypertensive patients are advised to perform a routine physical exercise such as cycling, swimming or jogging for 30 to 45 minutes a day. Regular exercise in normotensives reduces systolic blood pressure and diastolic blood pressure. This effect is even more pronounced in hypertensive patients: A recent meta-analysis showed a mean reduction of 7 mm Hg systolic and 5 mm Hg diastolic (Cornelissen and Fagard, 2005).
Table 1: Comparison of diastolic and systolic blood pressure within and between two groups

| Blood pressure     | Measuring time | Groups (mean ±SD) | P-value |
|--------------------|---------------|------------------|---------|
|                    |               | Group A (n=15)   | Group B (n=15) |         |
| Diastolic (mmhg)   | 1st month     | 93.8±8.57        | 92.9±7.1      | 0.75    |
|                    | 2nd month     | 87.4±10.9        | 85.6±5.5      | 0.709   |
|                    | 3rd month     | 85.4±6.7         | 84.4±5.5      | 0.621   |
|                    | P-value       | 0.01*            | 0.01*         |         |
|                    | Overall mean  | 87.04 ±4.1       | 87.1 ±5.9     | 0.965   |
| Systolic (mmhg)    | 1st month     | 132.1±8.6        | 132.3±5.8     | 0.972   |
|                    | 2nd month     | 123.5±9.7        | 127.2±6.6     | 0.196   |
|                    | 3rd month     | 120.3±8.9        | 124.7±7.6     | 0.130   |
|                    | P-value       | 0.0001*          | 0.0001*       |         |
|                    | Overall mean  | 123.4±5.7        | 125.6±6.9     | 0.272   |

Data are given as mean ± standard deviation (SD) P-value: probability value * Significant (P<0.05)

Table 2: Comparison all measured variables within and between two groups

| Variables | Groups          | Laboratory (mean ±SD) | P-value |
|-----------|-----------------|------------------------|---------|
|           |                 | Lab 1 | Lab 2 | Lab 3 |         |
| Cholesterol | Group A (n=15) | 196.6±9.2 | 199.5±10.4 | 190.0±9.8 | 0.0001* |
|           | Group B (n=15) | 187.4±9.34 | 175.6±10.5 | 170.6±9.9 | 0.001* |
|           | P-value         | 0.491 | 0.117 | 0.179 |         |
| Triglyceride | Group A (n=15) | 138.7±41.7 | 129±45.5 | 132.4±37.7 | 0.153 |
|           | Group B (n=15) | 130.4±53.7 | 122.8±50.9 | 116.5±48.5 | 0.332 |
|           | P-value         | 0.491 | 0.117 | 0.179 |         |
| HDL       | Group A (n=15) | 42.4±11.35 | 45.6±9.31 | 49.4±10 | 0.045* |
|           | Group B (n=15) | 51.8±7.2 | 49.9±9.22 | 53.2±10.32 | 0.047* |
|           | P-value         | 0.052 | 0.177 | 0.267 |         |
| LDL       | Group A (n=15) | 136.5±35.14 | 136.5±38.41 | 129.8±32.8 | 0.038* |
|           | Group B (n=15) | 133.2±37.11 | 117.083±38.7 | 111.8±36.95 | 0.041* |
|           | P-value         | 0.790 | 0.152 | 0.144 |         |

Data are given as mean ± standard deviation (SD) P-value: probability value * Significant (P<0.05)

Table 3: Post-hoc test between pairwise of laboratory within each group

| Variables | Groups | Laboratory 1 vs. Laboratory 2 | P-values of post-hoc test |
|-----------|--------|-------------------------------|---------------------------|
|           |        | Laboratory 1 vs. Laboratory 3 | Laboratory 2 vs. Laboratory 3 |
| Cholesterol | Group A | NS | NS | S |
|           | Group B | NS | NS | NS |
| HDL       | Group A | NS | NS | S |
|           | Group B | NS | NS | NS |
| LDL       | Group A | NS | NS | NS |
|           | Group B | S | S | NS |

P-value: probability value S: significant(P<0.05) NS: non-significant (P>0.05)
Wet cupping has also been shown to reduce low-density lipoprotein (LDL) levels and to increase high-density lipoprotein (HDL) levels (Mustafa et al., 2012).

Dunn studied the results of a 6-month aerobic exercise training program, which improved from 50 per cent to 85 per cent of full aerobic capacity for 20–60 minutes three days a week, and recorded substantial reductions in total cholesterol (-0.3 mmol / L, p<0.001) and total: HDL cholesterol (-0.3, p<0.001) (Dunn et al., 1997).

Zarei carried out a significant RCT in Iran, examining the efficacy of wet cupping in the treatment of hypertension. Its purpose was to research the impact of wet cupping on blood pressure in patients diagnosed with hypertension. The evaluation of the means of differentiating systolic and diastolic blood pressure inside the cupping community revealed a substantial difference in systolic blood pressure (SBP), but not in diastolic blood pressure (DBP). Furthermore, the comparison of the means of differentiating systolic and diastolic blood pressure between the cupping and the control groups revealed a substantial difference between the groups for SBP (Aleyeidi et al., 2019).

A 2015 study with a larger sample size indicated that Hijama therapy has been effective in reducing SBP in hypertensive patients. A more recent study (Ibrahim et al., 2016) indicated that 35 percent of participants tried Hijama therapy due to religious beliefs or a friend’s recommendation and reported feeling better, whereas only 30 percent reported adherence to their physician’s prescribed treatment. The low adherence to medication reported in the study was not consistent with another study showing adherence to antihypertensive medication by more than 70 percent (Ibrahim et al., 2016).

CONCLUSIONS

Accordingly, Findings of this study suggested the following conclusion: Both cupping therapy, as well as continuous aerobic exercises, showed a significant decrease in blood pressure and lipid profile (Total Cholesterol, Triglyceride and LDL) and a significant increase in HDL post-treatment compared with that pre-treatment, it gives the expected good effect of cupping therapy comparing to continuous aerobic exercise as an alternative treatment for patients who are bedridden or can’t do aerobic exercise due to any health problems.

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Conflict of Interest

The authors declare that they have no conflict of interest for this study.

REFERENCES

Aleyeidi, N. A., Aseri, K. S., Matbouli, S. M., Sulaiamani, A. A., Kobeisy, S. A. 2019. Effects of wet-cupping on blood pressure in hypertensive patients: A randomized controlled trial. J Integr Med, 13:391–400.

C. R. 2002. Effect of diet and exercise intervention on blood pressure, in−sulin, oxidative stress, and nitric oxide availability. Circulation, 106:2530–2532.

Cornelissen, V. A., Fagard, R. H. 2005. Effects of Endurance Training on Blood Pressure, Blood Pressure–Regulating Mechanisms, and Cardiovascular Risk Factors. Hypertension, 46(4):667–675.

Dunn, A. L., Marcus, B. H., Kampert, J. B., Garcia, M. E., Kohl, H. W., Blair, S. N. 1997. Reduction in Cardiovascular Disease Risk Factors: 6-Month Results from ProjectActive. Preventive Medicine, 26(6):883–892.

Guo, C. S. 2004. Blood-Letting Heart Views. J Tradit Chin Med, 5(2):74–85.

Ibrahim, I., Hassali, M., Saleem, F., Tukmagi, H. A. 2016. A qualitative insight on complementary and alternative medicines used by hypertensive patients. Journal of Pharmacy And Bioallied Sciences, 8(4):284–284.

James, P. A., Oparil, S., Carter, B. L., Cushman, W. C., Dennison-Himmelfarb, C., Handler, J., Lackland, D. T., LeFevre, M. L., MacKenzie, T. D., Ogedegbe, O., Smith, S. C., Svetkey, L. P., Taler, S. J., Townsend, R. R., Wright, J. T., Narva, A. S., Ortiz, E. 2014. Evidence-Based Guideline for the Management of High Blood Pressure in Adults. JAMA, 311(5):507–507.

Jones, H., Atkinson, G., Leary, A., George, K., Murphy, M., Waterhouse, J. 2006. Reactivity of Ambulatory Blood Pressure to Physical Activity Varies With Time of Day. Hypertension, 47(4):778–784.

Jones, H., Taylor, C. E., Lewis, N. C. S., George, K.
Atkinson, G. 2009. Post-Exercise Blood Pressure Reduction Is Greater Following Intermittent Than Continuous Exercise and Is Influenced Less by Diurnal Variation. *Chronobiology International*, 26(2):293–306.

Lee, M. S., Kim, J. I., E, E. 2011. Is cupping an effective treatment? An overview of systematic reviews. *J Acupuncture Meridian Study*, 4:1–4.

Leon, A. S., Sanchez, O. A. 2001. Response of blood lipids to exercise training alone or combined with dietary intervention. *Medicine and Science in Sports and Exercise*, 33(Supplement):S502–S515.

Mcardle, W. D., Katch, F. I., Victor, L., Katch 2006. Essentials of exercise physiology. pages 4991–4997.

Mustafa, L. A., Dawood, R. M., Om, A.-S. 2012. Effect of Wet Cupping on Serum Lipids Profile Levels of Hyperlipidemic Patients and Correlation with some Metal Ions. 23:129–136.

Park, S., Jastremski, C. A., Wallace, J. P. 2005. Time of day for exercise on blood pressure reduction in dipping and nondipping hypertension. *Journal of Human Hypertension*, 19(8):597–605.

Tibana, R., Pereira, G., Navalta, J., Bottaro, M., Prestes, J. 2012. Acute Effects of Resistance Exercise on 24-h Blood Pressure in Middle Aged Overweight and Obese Women. *International Journal of Sports Medicine*, 34(05):460–464.

Weber, M. A., Lackland, D. T. 2015. Global burden of cardiovascular disease and stroke: hypertension at the core. *The Canadian Journal of Cardiology*, 31(5):569–71.

Zarei, M., Hejazi, S., Sa, J., Farahani, H. 2012. The Efficacy of Wet Cupping in the Treatment of Hypertension. *ARYA Atherosclerosis Journal*, 8:1–4.