



Response of cholesterol to cupping therapy in post-menopausal women with hypercholesterolemia

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Abstract

Hypercholesterolemia is common in post-menopausal women, increasing their risk for cardiovascular, thyroid, kidney and liver diseases, as well as diabetes mellitus. The current study aimed to investigate the response of cholesterol to cupping therapy in post-menopausal women with hypercholesterolemia. Forty post-menopausal women, having hypercholesterolemia, were randomized into 2 equal groups. Group (A) received cupping therapy, once/month for 3 months, while group (B) didn't receive any therapy. All women were evaluated pre- and post-treatment by measuring the serum levels of total cholesterol, low density lipoprotein cholesterol (LDL-C) and high density lipoprotein cholesterol (HDL-C). Comparing both groups post-treatment showed that there was a statistically significant reduction in serum levels of total cholesterol and LDL-C ($P < 0.05$), while there was a statistically significant increase in serum levels of HDL-C ($P < 0.05$) in favour of group (A). Cupping therapy is an effective method for improving serum cholesterol levels in hypercholesterolemic post-menopausal women through decreasing total cholesterol and LDL-C and increasing HDL-C.

Keywords: cupping therapy, hypercholesterolemia, post-menopausal women

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INTRODUCTION

Hypercholesterolemia refers to excessively high levels of plasma cholesterol, which predisposes to many diseases mainly cardiovascular illness (Stapleton et al. 2010). Post-menopausal women have higher prevalence of hypercholesterolemia than pre-menopausal women, suggesting an etiological role for estrogen deficiency (Davidson et al. 2002, Reddy Kilim and Chandala 2013). Following menopause, women have increased levels of total cholesterol and LDL-C in addition to decreased levels of HDL-C, increasing their risk to develop cardiovascular diseases (Fonseca et al. 2017). Cholesterol levels in blood should be controlled to prevent negative consequences of hypercholesterolemia. Dietary modifications, physical activity and alternative therapies like cupping therapy are recommended for hypercholesterolemic patients (Fikri et al. 2010, Mahmood 2015). Cupping therapy represents one of the oldest therapies used for treating a broad range of diseases through increasing production of endogenous opioids in the brain, excreting pathological substances from the blood, boosting immunity and potentiating pharmacological therapy. It is

a simple, cost effective and time saving method that has three main steps, including suction, scarification and suction again (Al-Bedah et al. 2018, El Sayed et al. 2014). It has a positive effect on reducing total cholesterol blood levels in hypercholesterolemic patients (Fikri et al. 2010, Makiabadi and Zakarianezhad 2020). Although previous studies had examined the response of cholesterol levels to cupping therapy in hypercholesterolemic and dyslipidemic patients (El Sayed et al. 2014, Fikri et al. 2010, Hairon et al. 2017, Refaat et al. 2014), few of them have addressed this question in post-menopausal women with hypercholesterolemia. Therefore, the present study aimed to investigate the response of cholesterol to cupping therapy in post-menopausal women with hypercholesterolemia.

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MATERIALS AND METHODS

Study Design

The study was designed as a prospective, randomized, controlled trial. It was conducted between October, 2018 and September, 2019.

Participants

Forty post-menopausal women, diagnosed with hypercholesterolemia, were recruited from the outpatient internal clinic in Family Medical Center sixth district Nasr City, Cairo, Egypt. The inclusion criteria were total cholesterol levels of more than 200 mg/dL. The participants' age ranged from 45 to 55 years while the body mass index (BMI) ranged from 30 to 34.9 kg/m². They were excluded if they had hypertension, cardiovascular diseases, metabolic disorders, body temperature of more than 37.5 C° and hemoglobin levels of less than 10 g/dl. Additionally, all of them didn't receive cholesterol lowering drugs or follow a specific diet therapy.

Randomization

Each participant was informed about the study nature, purpose and benefits, the right to refuse or withdraw at any time, as well as the obtained data confidentiality. The hypercholesterolemic post-menopausal women were randomly assigned into 2 equal groups (group A and group B) using a computer-based randomization program. No subjects were dropped out from the study following randomization.

Interventions

Group (A) included 20 post-menopausal women who received cupping therapy, once/month for 3 months, while group (B) included 20 post-menopausal women who didn't receive any therapy.

Cupping therapy

All post-menopausal women in group (A) received wet cupping therapy, for 20 minutes, once per month, for 3 months. First, the skin was cleaned by alcohol and suitable sized cups were placed on the vertex, both scapula and paravertebral to the lumbar region on both sides. Then, the physical therapist sucked the air inside each cup via manual suction and left it for 3-5 minutes. Second, the therapist removed the cups and made superficial incisions on the skin by surgical blades after their sterilization. Third, the removed cups were replaced again on the previous sites, suction was applied again and cups were left for 3-5 minutes' till filling with blood. Fourth, the cups were removed. Finally, the cupping areas were cleaned, sterilized by betadine and dressed (Abagale et al. 2019, Hiron et al. 2017, Mohammadi and Sabourmoghaddam 2019). All women were asked to fast for 12 hours before the session and 125 ml of fruit juice was given for each woman at the end of the session.

Table 1. Baseline characteristics of postmenopausal women in both groups

Items	Group A	Group B	Comparison		S
	Mean ± SD	Mean ± SD	t-value	P-value	
Age (years)	50.73±2.93	50.86±3.37	-0.115	0.909	NS
BMI (kg/m ²)	32.13±1.72	32.53±1.68	-0.642	0.526	NS

*SD: standard deviation, P: probability, S: significance, NS: non-significant.

Outcome Measures

Measurement of serum cholesterol levels

The serum levels of total cholesterol, LDL-C and HDL-C were measured, using Cobas 6000 analyzer (Roche Diagnostics, IN, USA), for all women in both groups (A & B) before the beginning of the first session and 48 hours following the last session of cupping. All blood samples were taken after 12 hours of fasting (Refaat et al. 2014).

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS) computer program (version 23) was used for data analysis. Prior to final analysis, data were screened for normality assumption, homogeneity of variance, and presence of extreme scores. Such exploration was done as a pre-requisite for parametric calculations of the analysis of difference and of relationship measures. Normality test of data using Shapiro-Wilk test revealed that the data was normally distributed for total cholesterol, HDL and LDL. There was homogeneity of variances, as assessed by Levene's ($p > .05$) for all dependent variables. Accordingly, 2x2 Mixed MANOVA test was used to compare total cholesterol, HDL and LDL at different measuring periods at the two groups. The p-value of less than 0.05 was considered significant, while the p-value of less than 0.01 was considered highly significant (Salleh et al. 2019).

RESULTS

Both groups were similar at baseline ($p > 0.05$) regarding age and BMI, and all outcome measures (**Tables 1-2**).

Statistical analysis using 2x2 mixed design MANOVA indicated that there were no significant effects of the tested group (the first independent variable) on the all tested dependent variables ($F=2.797$, $P=0.063$). As well as, there were significant effects of the measuring periods (the second independent variable) on the tested dependent variables ($F=77.746$, $P=0.0001^*$). Additionally, the interaction between the two independent variables was significant, which indicates that the effect of the tested group (first independent variable) on the dependant variables was influenced by the measuring periods (second independent variable) ($F=77.746$, $P=0.0001^*$). The total cholesterol and LDL showed a statistically highly significant reduction and highly significant increase at HDL ($P=0.0001$) at group A only. The post-treatment comparison of both groups revealed a statistically highly significant reduction at total

Table 2. Descriptive statistics and Multiple pairwise comparison tests (Post hoc tests) for the all dependent variables for both groups at different measuring periods

Variables	Group A		Group B	
	Pre treatment	Post treatment	Pre treatment	Post treatment
Cholesterol	30.3.23±35.36	279.84 ±33.30	304.71 ±29.01	304.71±29.01
HDL	58.5±18.52	65.61 ±18.03	49.82 ±16.88	49.82±16.88
LDL	155.92±32.27	137.46 ±28.75	166.21 ±28.06	166.21 ±28.06
Within groups (Pre Vs. post)				
p-value	Total cholesterol	HDL	LDL	
Group A	.0001*	.0001*	0.0001*	
Group B	1.00	1.00	1.00	
Between groups (group A Vs. group B)				
	Total cholesterol	HDL	LDL	
Pre treatment	0.906	0.214	0.384	
Post treatment	0.04*	0.027*	0.014*	

*Significant at the alpha level ($p < 0.05$)

cholesterol and LDL and highly significant increase at HDL in favour of group (A) (Table 2).

DISCUSSION

Hypercholesterolemia has high prevalence in the elderly people due to its connection to comorbidity as well as genetic and environmental factors, with a higher incidence in post-menopausal women than men. The high cholesterol levels increase the risk of elderly people to develop coronary heart diseases (Davidson et al. 2002, Félix-Redondo et al., 2013). Thus, the present study was conducted to investigate the response of cholesterol to cupping therapy in post-menopausal women with hypercholesterolemia.

Concerning total cholesterol, it showed a statistically significant decrease within group (A), while it showed a non-significant difference within group (B). Additionally, group (A) had significantly lower levels of total cholesterol as compared to group (B) post-treatment. These results were consistent with Fikri et al. (2010) who found a significant reduction in total cholesterol of hypercholesterolemic patients by 12% in the group of cupping when compared to the control group. Also, Mustafa et al. (2012) reported a significant reduction in total cholesterol levels following cupping therapy by one week and two weeks. In addition, Hairon et al. (2017) found a significant decrease in total cholesterol levels from baseline to the third and fourth months in the cupping group. Moreover, Alajwad et al. (2018) concluded that cupping is an effective modality in decreasing the serum levels of total cholesterol after one week of application in hyperlipidemic patients. On the other hand, Niasari et al. (2007) and Refaat et al. (2014) reported non-significant differences with regard to total cholesterol levels in healthy men subjected to cupping therapy.

Concerning LDL-C, it showed a statistically significant reduction within group (A), while it showed a

non-significant difference within group (B). Additionally, group (A) had significantly lower levels of LDL-C when compared to group (B) post-treatment. These findings agreed with Niasari et al. (2007) who investigated the effectiveness of wet cupping in reducing the serum LDL-C levels of healthy men, protecting them from developing atherosclerosis. Additionally, Mustafa et al. (2012) found a significant decrease in LDL-C levels at the next two weeks after wet cupping in hyperlipidemic patients. Moreover, Refaat et al. (2014) reported a significant reduction in LDL-C after 2 months of wet cupping. Furthermore, Hairon et al. (2017) found a significant reduction in LDL-C levels in the cupping group from pre-treatment to the third and fourth months. In contrast, Alajwad et al. (2018) reported that wet cupping has no effect on LDL-C levels in hyperlipidemic males and females.

Concerning HDL-C, it showed a statistically significant increase within group (A), while it showed a non-significant difference within group (B). Additionally, group (A) had significantly higher HDL-C levels when compared to group (B) post-treatment. These results could be supported by Refaat et al. (2014) who found that 2 months of wet cupping significantly improved HDL-C levels in healthy men. Also, Hairon et al. (2017) reported the efficacy of cupping therapy in increasing HDL-C levels from baseline to the third and fourth months. Conversely, Niasari et al. (2007) showed that cupping therapy has no impact on HDL-C levels of healthy men. Additionally, Mustafa et al. (2012) and Alajwad et al. (2018) showed non-significant changes in HDL-C levels in hyperlipidemic patients received cupping therapy.

The contrast among studies regarding different cholesterol levels (total cholesterol, LDL-C and HDL-C) could be related to the variation in the design and duration of the study, the age and sex of the treated sample, as well as the technique and site of cupping application.

The results of the current study showed that cupping therapy for 3 months had a positive effect on serum levels of cholesterol through decreasing total cholesterol and LDL-C levels and increasing HDL-C levels in hypercholesterolemic post-menopausal women. These findings could be attributed to the detoxifying effect of cupping as it clears blood from pathological substances, like total cholesterol and LDL-C, through skin scarifying and blood suctioning by the cups. In the cupped area, certain vasodilators like histamine, adenosine and noradrenaline enhance vasodilatation of blood vessels, resulting in circulatory improvement and toxins elimination from the body (El Sayed et al. 2014, Al-Bedah et al. 2018). The blood detoxification effect of cupping could be confirmed by previous studies that compared the cholesterol levels between the cupping blood and the venous blood. They found higher levels of cholesterol in the cupping blood than in the venous

blood. Accordingly, they assumed that there might be an unrecognized substance in the cupping blood that is drawn and removed from the body by cupping and its removal might create a proper balance between different vital parameters (Bilal et al. 2011, Mahdavi et al. 2012).

CONCLUSION

Cupping therapy has favorable effects on reducing total cholesterol and LDL-C serum levels as well as increasing HDL-C serum levels in post-menopausal women with hypercholesterolemia. Thus, it may have a prophylactic effect against cardiovascular diseases.

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