


CLINICAL BIOCHEMISTRY

## Study the Effect of Wet Cupping on Haematological Parameters and Lipid Profile Level in Hyperlipidemic and Hypertensive Patients in Brack Alshatti - Libya

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### ABSTRACT

Cupping therapy has been used to treat some diseases and relief pain. It refers to placing partially deflated cups on specific parts of the patient's body and has become more popular in certain settings. Prolonged repetitive bloodletting is associated with a reduction in cardiovascular disease (CVD). This study aimed to evaluate the effect of cupping on the Plasma lipid profile concentration in patients with hyperlipidaemia and its effect on high blood pressure. The study was conducted on 56 female patients, 39 of them suffering from hyperlipidaemia (first group), and 17 female patients surfing from hypertension (second group), with age range 30 - 60 years. Blood samples were twice collected, before and a week after cupping. Each sample was divided into two parts, the first one was collected in K2-EDTA tubes for complete blood count examination, and the second part was placed in plain tubes for determination of total cholesterol (T.CHO), triglyceride (TG), high density lipoprotein cholesterol (HDL-c), and low density lipoprotein cholesterol (LDL-c). The results of first group showed no significant effects on haematological parameters, while, there was a significant decrease in T.CHO and LDL-c ( $P < 0.05$ ), but a significant effect ( $P > 0.05$ ) in TG and HDL-c after cupping. Also the second group showed a significant decrease in systolic (SBP) and diastolic blood pressure (DBP) with significant increase in HDL-c and decrease in blood lipids with no significant effect of haematological parameters. In conclusion, wet cupping may has an effect to decrease blood lipids, and lowering of high blood pressure, for this reason it may play an important role in the prevention of CVD.

## دراسة تأثير الحجامة الرطبة على المؤشرات الدموية ومستوى الدهون عند المرضى الذين يعانون من ارتفاع مستوى دهون الدم وارتفاع ضغط الدم في منطقة براك الشاطئ - ليبيا

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### الكلمات المفتاحية :

العلاج بالحجامة  
البروتينات الدهنية عالية الكثافة والبروتينات  
الدهنية منخفضة الكثافة  
ارتفاع دهون الدم.

### الملخص

يستخدم العلاج بالحجامة لعلاج بعض الأمراض وتخفيف الآلام. وهي عبارة عن وضع أكواب مفرغة جزئيًا من الهواء على أجزاء معينة من جسم المريض، وقد أصبحت شائعة في الكثير من المناطق. ويرتبط التبرع بالدم المتكرر لفترات طويلة بانخفاض في الإصابة بأمراض القلب والأوعية الدموية. هدفت هذه الدراسة إلى تقييم تأثير الحجامة على تركيز الدهون في البلازما لدى مرضى فرط دهون الدم و على ارتفاع ضغط الدم. أجريت الدراسة على 56 مريضة، 39 منهن يعانين من ارتفاع دهون (الأولى)، و 17 مريضة تعاني من ارتفاع ضغط الدم (المجموعة الثانية)، تراوحت أعمارهن بين 30 و 60 سنة. جُمعت عينات الدم من كل مريض مرتين، وقُسمت كل عينة إلى جزئين، جُمع الجزء الأول في أنابيب K2-EDTA لفحص تعداد الدم الكامل، ووضِع الجزء الثاني في أنابيب لا تحتوي على مانع تجلط لتعيين مستوى الكوليسترول الكلي والدهون الثلاثية والبروتينات الدهنية عالية الكثافة والبروتينات الدهنية منخفضة الكثافة. أظهرت نتائج المجموعة الأولى عدم وجود تأثيرات معنوية على مؤشرات الدم، بينما كان هناك تأثير معنوي ( $P < 0.05$ ) على انخفاض مستوى الكوليسترول الكلي والبروتينات الدهنية منخفضة الكثافة، ولم تُظهر أي تأثير معنوي ( $P > 0.05$ ) على مستوى الدهون الثلاثية والبروتينات الدهنية عالية الكثافة في المجموعة الأولى بعد الحجامة. أيضًا في المجموعة الثانية أظهرت النتائج انخفاضًا معنويًا في مستوى ضغط الدم الانقباضي والانقباضي مع زيادة معنوية في البروتينات الدهنية عالية الكثافة، وانخفاض طفيف لكنه معنوي في نسبة دهون الدم مع عدم وجود تغير في مؤشرات الدم الأخرى. الخلاصة: الحجامة الرطبة قد يكون لها تأثير إيجابي على مستوى خفض الدهون في الدم، و ضغط الدم المرتفع، ولهذا السبب قد تلعب دورًا هامًا في الوقاية من أمراض القلب والأوعية الدموية.

### Introduction

Complementary and Alternative Medicine (CAM) is well known around the world, and in every culture, it is an umbrella term that includes a wide range of treatment options

complementary to conventional treatments, to help relieve symptoms [1]. Cupping (Al-hejamah) has been used as an alternative treatment for many diseases [2]. The Arabic name

for cupping therapy is Al-Hejamah which has been part of the cultural practice in the Middle East for thousands of years with citations dating back to the time of Hippocrates (400 BC) [3].

Cupping therapy can be divided into two main categories: Dry cupping and wet cupping. Dry cupping simply pulls the underlying tissue up into the suction cup, while wet cupping uses the same technique, but adds abrasions and bloodshed [4]. Cupping practitioners in traditional Chinese medicine believe that diseases result from stagnation or blockage of vital energy sources in the body. They believe that cupping works by lifting the ban on the body's energy trajectories and restoring the correct balance to restore its flow.

They explained that cupping therapy can remove cold, moisture and blood stagnation, especially when combined with acupuncture [5]. Hong et al., in 2011, Said that cupping therapy works by altering tissue structures at the cupping position as a result of negative pressure in cups used for cupping that extend to the nerves and muscles, causing an increase in blood circulation and autoimmune haemorrhage [6].

The theory presented by El-Sayed et al., in 2013 [5], cupping is an artificial kidney that processes the filtration of the capillaries in the skin with a mechanism similar to the filtration process in the renal glomeruli. The size of the dissociated molecules depends on a higher pressure than the filtration pressure in the renal glomeruli [5]. Cupping works to improve the functions of many organs. Currently, wet cupping is used for health disorders resulting from excess iron, which causes polycythaemia, and an increase in hemosiderin and morphine. Cupping is also used to reduce the level of low-density lipoprotein, and level of cholesterol in the blood. Use of wet cupping has a role in reducing the risks of CVD and atherosclerosis because it works to reduce the level of cholesterol in the blood and low density lipoproteins- cholesterol (LDL-c) [7].

Refaat et al., in 2014 [2], demonstrated that performing Al-hejamah during a fasting state could represent a useful complementary method for regulating Diastolic Blood Pressure (DBP) and preventing/treating risk factors associated with CVD. In another study conducted by researcher Alajwad et al., in 2017 [8], they found that Al-hijama has an effect on reducing the level of T.CHO and TG in the blood. Therefore, cupping may heart-protective and moisturizing as well. Cupping may represent a potential complementary treatment for patients with hyperlipidaemia. Suhaily, et al., in 2017 [9], investigated that repeated treatment with wet cupping was also beneficial in improving CVD risk factors, and that the potential effects of wet cupping in improving blood lipid levels could give new perspectives in reducing and preventing CVD risk at low cost. Easy to perform and minimal intervention.

Al-Shamma, and AbdilRazzaq in 2009 [10], reported a significant decline in Mean Blood Pressure (MBP), Wight Blood Cell (WBC) count, Neutrophil % (N%) and Monocyte % (M%). However, there is a significant rise in haemoglobin (Hb) concentration, platelets count and Lymphocyte % (L%) but Heart Rate (HR) and Eosinophil % (E%) showed no significant changes after cupping. Also it has an effect on anthropometric parameters as well as haematological parameters, and this will lead to improvement in the blood circulation and prevention of CVDs.

In another trial, Iranian researchers investigated the effectiveness of wet cupping therapy for treating non-specific low back pain and concluded that "wet cupping is associated with greater short-term clinical benefit than usual care and no adverse effects were reported" [11].

This study aimed to evaluate the effect of wet cupping on serum lipid concentration of those with high serum cholesterol and as well as its effect on high blood pressure.

## Materials and methods

The study was conducted on 56 patients, who were divided into two groups. The first group included 39 patients suffering from hyperlipidaemia, and the second group included 17 patients suffering from high blood pressure, their aged ranged from 30 to 60 years. blood pressure, waist circumference (WC), and height and weight were measured for all patients before cupping which were used to calculate the body mass index (BMI) by equation of weight (kg) divided by height in  $m^2$ , and the questionnaires were filled out by each patient.

Ten millilitre (10 ml) of venous blood samples were collected at the cupping sites in the municipality of AL-Shatti, and a comprehensive cupping was done for each volunteer. Two blood samples were taken from each volunteer. The first sample was taken immediately before the cupping procedure and the second one a week after the cupping procedure. Each blood sample was divided into two containers, the first container containing K2-EDTA which was used for complete blood count (CBC) examination, and the second container plain tube that was used for collection of serum samples by centrifugation for 10 minutes at 3000 rpm and stored in a  $-20^{\circ}C$ , and is used to determine the concentration of a lipid profile including: T.CHO, TG, HDL-c and LDL-c, were measured by ready-made Kits prepared by the Swiss company Roche and using the Cobas Integra 400 plus device. Statistical analysis of the results was performed using the SPSS statistical program. Paired samples t-test was used to compare different time points of the study (pre- and post-intervention).  $P < 0.05$  was considered statistically significant.

## Results

Data in Table 1 showed the anthropometric parameters of female patients (first group), with mean age of  $47 \pm 1.27$  years.

**Table 1:** The Anthropometric Parameters for the women patients (first group)

Anthropometric Parameters	Female patients M $\pm$ SE
Age (years)	$47 \pm 1.27$
Waist circumference (WC) (cm)	$92.9 \pm 0.08$
Body mass index (BMI) ( $kg/m^2$ )	$30.4 \pm 1.21$

Data presented in Table 2 shows a comparison of the biochemical parameters of the participant before and after cupping. The concentration of the T.CHO and LDL-c were significantly decreased ( $P < 0.05$ ) a week after cupping in all participant. The concentration of TG was slightly reduced after cupping but was not statistically significant ( $P > 0.05$ ). On the other hand, the concentration of HDL-c was not affected a week after cupping.

**Table 2:** The concentration of serum lipid profile before and after cupping in female patients (first group).

Biochemical Parameters (mg/dl)	Before cupping M ± SE	A week after cupping M ± SE	P-value
T.CHO	242.5±5.61	223.6±5.89	0.008*
TG	126.5±10.02	119.3±9.26	0.375
HDL-c	50.94±2.46	50.46±2.45	0.566
LDL-c	166.3±5.29	149.7±5.38	0.007*

\* A significant difference

The haematological parameters of female patients (first group) before and after cupping, which showed slightly changes but not statistically significant in the concentration of haemoglobin, the count of WBCs, red blood cells (RBCs), and platelets (PLT) (Table 3).

**Table 3:** The haematological parameters of the female patients (first group) before and after cupping.

Haematological Parameters	Before cupping M ± SE	A week after cupping M ± SE	P-value
Hb(g/dl)	11.7±0.24	11.9±0.24	0.126
WBCs (*10 <sup>9</sup> /L)	5.53±0.39	5.32±0.30	0.586
RBCs (*10 <sup>12</sup> /L)	4.29±0.05	4.34±0.06	0.273
PLT (*10 <sup>9</sup> /L)	252.2±10.32	264.7±8.97	0.206

The second group included 17 patients (hypertensive patients), data in table 4 showed the anthropometric parameters, with the average age of 50±1.57 years.

**Table 4:** The anthropometrics parameters of patients with high blood pressure (second group).

Parameters	Women Participants M ± SE
Age (years)	50 ± 1.57
WC (cm)	104.80 ± 3.92
BMI (kg/m <sup>2</sup> )	35.4 ± 2.10

Table (5) showed a significant decrease in SBP and DBP after cupping (P<0.05).

**Table 5:** Blood pressure measurements of women patients with high blood pressure (second group).

Parameters	Women Participants M ± SE		P-value
	Before cupping M ± SE	After cupping M ± SE	
SBP	134.71 ± 3.74	123.53 ± 3.73	*0.000
DBP	87.06 ± 2.01	78.82 ± 1.63	*0.000

\* A significant difference

The differences between the concentration of T.CHO, TG, and LDL-c before and after cupping decrease slightly but are not statistically significant (P>0.05). While the HDL-c concentration increased significantly after a week of cupping (P<0.05) (Table 6).

Data of the second group in Table 7 demonstrated that slightly changes in the haemoglobin concentration, white blood cell count, red blood cell count, and platelet count after

cupping compared with before cupping but not statistically significant (P>0.05).

**Table 6:** The concentration of serum lipid profile before and after cupping in female patients (second group).

Biochemical Parameters (mg/dl)	Before cupping M ± SE	A week after cupping M ± SE	P-value
T.CHO	209.70 ± 10.45	203.29 ± 10.19	0.295
TG	118.76 ± 11.51	109.47 ± 9.96	0.083
HDL-c	44.47 ± 2.47	47.70 ± 2.75	0.020*
LDL-c	141.45 ± 9.57	133.92 ± 9.34	0.202

\* A significant difference

**Table 7:** Haematological parameters of the female patients (second group) before and after cupping.

Haematological Parameters	Before cupping M ± SE	A week after cupping M ± SE	P-value
Hb(g/dl)	11.79 ± 0.28	11.81±0.34	0.10
WBCs (*10 <sup>9</sup> /L)	7.14±0.82	6.35±0.60	0.297
RBCs (*10 <sup>12</sup> /L)	4.27±0.08	4.33±0.09	0.391
PLT (*10 <sup>9</sup> /L)	247.4±15.6	267.7 ± 23.1	0.332

## Discussion

Research related to medicine and drugs aims to discover and treat diseases, determine the best treatment protocols for human diseases, and improve the quality of life without neglecting the economic aspect of treatment [12]. Wet cupping is an effective, economical and time-saving treatment, with a long history in all different human civilizations [12]. Cupping is a simple surgical procedure based on medical and scientific foundations. The main purpose of this treatment is to speed up blood circulation and eliminate waste from the body. Local damage to the skin and capillaries may act as a trigger for pain. Cupping is believed to remove harmful substances from the skin's microcirculation and interstitial space [13].

High Serum concentrations of T.CHO and LDL-c are closely associated with the prevalence of coronary heart disease (CHD) worldwide [14].

Hyperlipidaemia was classified into two subcategories: Hypercholesterolemia, which is accountable for atherosclerosis and ischemic heart disease, and hypertriglyceridemia [15]. Frequent blood donation has been reported to be successful in lowering blood lipids. Prolonged frequent bloodletting is associated with a reduction in CVD [15].

Observational studies of disease incidence have focused attention on the beneficial effects of lipid-lowering therapy in reducing LDL-c concentrations and the frequency of clinical events [16]. Mutations in key genes associated with LDL-c absorption are the main cause of elevated plasma LDL-c levels, hence familial hypercholesterolemia (FH) is a more common autosomal dominant disorder with an estimated prevalence of 1:200-500, which is the hallmark of FH. Plasma LDL-c accumulation contributes to the development of atherosclerosis and premature CVD, the most relevant

complications derived from elevated plasma LDL-c levels. [17].

In this study, wet cupping has been conducted only once and the sample that was taken one week after cupping shows a significant effect the level of T.CHO and LDL-c.

It has been shown that blood donation and phlebotomy significantly reduce blood cholesterol levels [18]. These results were consistent with the study conducted by Mostafa et al., in 2012 [19] and Alajwad et al., in 2017 [8].

Cholesterol-lowering mechanisms have become fundamental to the prevention of heart disease and are already being used to reduce mortality from coronary heart disease in the United States [20, 21].

The underlying mechanism facilitating its beneficial effect remains unclear. Many questions are asked from time to time about the precise role of cupping in treating diseases to clarify the benefits of cupping therapy. It has been suggested that the cups produce hyperaemia or homeostasis which results in a therapeutic effect. Wet cupping is claimed to drain excess fluids and toxins, loosen adhesions and lift connective tissue, bring blood flow to the skin and muscles, and stimulate the peripheral nervous system. Also reduces pain and high blood pressure and regulates nervous hormones and the immune system. Cupping therapy used to improve subcutaneous blood flow and stimulate the autonomic nervous system [22,23].

In this study, the effect of wet cupping on women who suffering from high blood pressure (second group) was determined, and there was a significant decrease in SBP and DBP. These results agreed with the study conducted by Refaat et al., in 2014 [2], reported decrease in DBP and an increase in the level of HDL-c in the participants. Also Aleyeidi et al., in 2015 [24], reported that wet cupping therapy is effective in lowering SBP in hypertensive patients for up to 4 weeks, without serious side effects. In our study, hypertension improved significantly ( $P < 0.05$ ) in female patients after wet cupping treatment (Table 5), which is similar to the results of another study that reported a clear relationship between wet cupping treatment and systolic blood pressure reduction in female patients with high blood pressure [16]. Wet cupping significantly increased HDL-c in hypertensive female patients (Table 6), and reduce the level of lipid profile, also there were slightly changes in erythrocyte, leukocyte and platelet counts but not statistically significant in these patients (Table 7). the same result obtained by Rahman, et al., in 2020.[16]. In conclusion, wet cupping therapy is not harmful to health, and has a significant effect in increasing HDL-c, and reducing T.CHO, TG, LDL-c, also lowering high blood pressure, thus cupping may serve as a complementary therapy for treating hyperlipidaemia, high blood pressure, and preventing heart disease.

### Recommendations

In order for cupping to have an effective role in treating and reducing high blood lipids and high blood pressure, a regular cupping program must be followed and sufficient time should be given after cupping to evaluate the effect, in addition to conducting extensive studies on it.

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