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Effect of Wet Cupping on Serum Lipids Profile Levels of Hyperlipidemic Patients and Correlation with some Metal Ions

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ABSTRACT

The present study was conducted to evaluate the effect of cupping therapy on serum lipid profile concentration and correlated to some trace elements (Cu, Zn, and Mn). Thirty one men (35 to 55 years old), with hyperlipidemia and without antihyperlipidemic drug or high energy diet consumption for the duration of the study were subjected to cupping. The serum for total cholesterol, triglyceride, lipoprotein (HDL, LDL) and trace elements concentration was collected from brachial veins, and determined before cupping and then once a week for two weeks after cupping. Patients with hyperlipidemia who subjected for cupping show a significantly decrease ($p \leq 0.05$) in total cholesterol, LDL cholesterol, and LDL/HDL ratio by comparison before cupping, while there were no significant differences in serum HDL cholesterol and triglyceride concentrations. Zn concentration and Cu/Zn ratio show a highly significant difference ($p<0.001$) after cupping and also showed a significant correlation with serum lipids profile after cupping, especially zinc metal.

Keywords: Cupping, Hyperlipidemia, Metal ions, Cholesterol.

تأثير الحجامة الرطبة على مستويات الدهون في مصل مرضى ارتفاع الدهون وعلاقتها مع بعض الايونات المعدنية

الملخص

تضمن هذا البحث متابعة تأثير الحجامة على مستوى الدهون وعلاقتها ببعض الايونات المعدنية (Cu و Zn و Mn). تضمنت الدراسة 31 مريضاً تراوحت أعمارهم 35-55 سنة مصابين بارتفاع الدهون و بدون اخذ أدوية مضادة لارتفاع الدهون او تناول أغذية عالية الطاقة، خضعوا للعلاج بالحجامة لمدة أسبوعين. تم قياس مستوى الكولسترول الكلي و الدهون الثلاثية والبروتينات الدهنية (HDL, LDL) والايونات المعدنية في مصل

المرضى الخاضعين للحجامة قبل الحجامة و بعدها مرة واحدة في الأسبوع ولمدة أسبوعين. أظهرت النتائج انخفاضا معنويا ($p\leq0.05$) في مستوى الكولسترول الكلي والبروتينات الدهنية واطئة الكثافة LDL وفي النسبة LDL/HDL مقارنة بنتائج قبل الحجامة. تركيز ايون الخارصين و نسبة ايون النحاس / ايون الخارصين أظهرت اختلافا معنويا ($P<0.001$) بعد الحجامة، كذلك أظهرت النتائج وجود علاقة طردية معنوية بين الايونات المعدنية ومستوى الدهون قبل و بعد الحجامة وخصوصا عنصر الخارصين.

الكلمات الدالة: حجامة، ارتفاع الدهون، الايونات المعدنية، كولسترول.

INTRODUCTION

Cupping therapy is one of the oldest documented medical techniques (Koptchuk *et al.,* 1997*)*. It is an ancient method for treatment and cure of a broad range of conditions; blood diseases such as haemophilia, hypertention, rheumatic conditions, pain relief, inflammatory conditions, mental and physical relaxation (Kaleem *et al.,* 2007), tension and migraine headache (Ahmadi *et al.,* 2008*)* polycythemia, heamochromatosis (Wright *et al.,* 2000), hyperlipidemia (Wei, 2005), menopause syndrome (Jiang *et al.,* 2004), pain of the knee, liver diseases, renal and uretric colic and other diseases (Akhtar and Siddiqui, 2007). The aim of cupping is to extract blood that is believed to be harmful from the body which in turn rids the body of potential harm from symptoms leading to a reduction in well-being (Kaleem *et al.,* 2007). The Arabic name for cupping therapy is Al-Hejamah which it has been part of middle-eastern cultural practice for thousands of years with citations dating back to the time of Hippocrates (400BC) (Curtis, 2005). Sixty percent (60%) of medical schools in the U.S.A have been teaching cupping as a part of complementary medicine (CM) (Eisenberg *et al.,*1998). It is also being practiced at Harvard medical school and Johns Hopkins medical center, two of the most prestigious medical centers in the world (Skaar, 2004). Cupping therapy can be divided into two broad categories; dry cupping and wet cupping. Dry cupping simply pulls the local underlying tissue up into the suctioning cup, whereas wet cupping uses the same technique, but adds scarification and bloodletting (Ahmadi *et al.,* 2008). Hyperlipidemia which is divided into two subcategories; hypercholesterolemia which is responsible for atherosclerosis and ischemic heart disease, and hypertriglcridemia which responsible for pancreatitis. The effectiveness of repeated blood donation in lowering blood lipids has been studied. Prolonged repeated bloodletting is associated with a reduction in cardiovascular events *(*Niasari *et al.,* 2007). Patients with hyperlipidemia who donated blood and received antihyperlipidemia drug had nearly a twofold reduction in serum total cholesterol, LDL cholesterol and triglyceride level in comparison with patients who were treated with antihyperlipidemia drug only *(*Niasari *et al.,* 2007). Trace elements such as Cu, Zn and Mn are essential nutrients for humans and are needed in very small amounts for many physiological functions, including immune, antioxidant function, growth and reproduction (Cunnane, 1988). Trace elements also affect many aspects of

lipid metabolism through enzymes and have modulatory effects on the synthesis and metabolism of lipids (Koo and Williams, 1981). Therefore, the aim of the present study was conducted to investigate the effect of wet cupping on serum lipid profile in hyperlipidemic patients with correlation to trace elements. Significance of cupping is confirmed by the fact that our Prophet Mohammed (Sallallahu Alayhi Wasallam) advised Cupping (Hijama) in many prophetic traditions (Hadiths) and laid great emphasis in using it. In Hadith narrated by Ibn Umar reported that the Prophet Mohammed (Sallallahu Alayhi Wasallam) said "Cupping (hijama) on an empty stomach is best. In it are a cure and a blessing. It improves the intellect and the memory" [Saheeh sunan ibn Maajah (3487)].

MATERIALS AND METHODS

Subjects

Thirty one men (35-55 years old), were included in the present study; they were clinically and pathologically diagnosed as hyperlipidemic patients by a specialist doctors. The criteria of ATP III (Adult Treatment Panel III) were considered for enrollment in the study (Grundy *et al.,* 2004). The patients whom subjected to wet cupping were fasted for 12-14hrs and without taking any of antihyperlipidemic drug or high energy diet consumption for the duration of the study. Wet – cupping was performed in one of private clinic for cupping in Mosul city by a specialized person. The hygienic procedure was conducted using consistent incisions (7 incisions with approximate depth of 2 mm and length of 1 cm) and sucking for 3 minutes in the inter scapular area. On average, a total quantity of 50 ml of blood was collected from each patient (Niasari *et al.,* 2007).

Samples

Sera samples: 10 milliliters of venous blood obtained from each male before and after cupping and then once a week for two weeks after cupping. The blood allowed to stand at room temperature and then centrifuged at 3000 rpm for 15 min. serum separated and stored at-20°C for subsequent analysis (Robby, 1980). Serum total cholesterol, HDL cholesterol and triglyceride levels were measured (Burtis and Ashwood, 1999) using kit enzymatic method from Biolabo Company (France). Indirect serum LDL cholesterol was calculated via the equation (friedwald formula): [Total cholesterol - (HDL+TG/2.2)] (Rifai and Warnick, 2006). Copper, zinc and manganese concentrations were measured using atomic absorption spectrophotometer (Shimadzo AA-670, Kyoto, Japan) (Tietz, 1999).

Statistical Analysis

The findings were expressed as the mean± standard deviation. The data analyzed with student's independent t- test. All statistical analyses were performed with the program statistical package for the social science (SPSS) for windows, version 10.0. A (p) value of $\leq$ 0.05 was accepted as statistically significant (Joaquim, 2007).

RESULTS AND DISCUSSION

Serum concentrations of total cholesterol, HDL cholesterol, LDL cholesterol, triglyceride and LDL/HDL ratio are presented in Table 1. Patients with hyperlipidemic who subjected to cupping show a significant decrease($p \leq 0.05$) in total cholesterol, LDL cholesterol and LDL/HDL ratio (5.04±0.67, 3.62±0.69, 3.44±0.94) (5.06±0.71, 3.56±0.85, 3.38±1.08) mmol/L in weeks 1 and 2 respectively by comparison before cupping (5.41±0.68, 4.03±0.7, 3.99 ±1.08) mmol/L. While there were no significant changes in serum HDL cholesterol and triglyceride (1.07±0.12, 1.71±0.41) (1.08±0.11, 1.69±0.32) mmol/L in weeks 1 and 2 respectively by comparison before Cupping (1. 04±0.11, 1.69±0.42) mmol/L.

Table 1: Concentrations of Lipid profile before Cupping and After Cupping

Lipids profile	Before Cupping	After Cupping			
		Week 1	(p) value	Week 2	(p) value
Total cholesterol(mmol/L)	5.41±0.68	5.04±0.67	0.036*	5.06±0.71	0.05*
HDL cholesterol(mmol/L)	1.04±0.11	1.07±0.12	0.17	1.08±0.11	0.1
LDL cholesterol(mmol/L)	4.03±0.7	3.62±0.69	0.023*	3.56±0.85	0.022*
Triglyceride (mmol/L)	1.69±0.42	1.71±0.41	0.827	1.69±0.32	0.99
LDL/HDL ratio	3.99±1.08	3.44±0.94	0.038*	3.38±1.08	0.029*

- Significant difference $P \leq 0.05$

The result of the present study have shown a significant decrease ($p \leq 0.05$) in total cholesterol, LDL- cholesterol and LDL/HDL ratio in weeks 1 and 2 after cupping by comparison before cupping. While there were no significant changes in serum HDL cholesterol and triglyceride. Total cholesterol and LDL cholesterol concentrations in blood are highly correlated with the prevalence of coronary heart disease throughout the world (Keys *et al.,* 1984). Observational studies of the incidence of disease have focused attention on the beneficial effects of lipid – lowering therapy in reducing both LDL cholesterol concentration and the frequency of clinical events (Anderson *et al.,* 1987). The emphasis placed on lowering plasma LDL cholesterol concentration also reflects the increased risk of coronary heart disease in patients with heterozygous familial hypercholesterolemia, a disorder characterized by high plasma LDL cholesterol concentration and the early onset of coronary disease (Goldstein *et al.,* 1995). The effect of Cupping on LDL- cholesterol that we observed in hyperlipidemic patients are consistent with the finding of previous study (Niasari *et al.,* 2007) which shown that

Cupping is an effective method in reducing LDL cholesterol and in LDL/HDL ratio, while not shown significant influence on each of total cholesterol, HDL cholesterol and triglyceride; therefore any change in the LDL/HDL ratio seem to be related to the reduction in LDL cholesterol. Lowering plasma cholesterol concentration reduce the availability of atherogenic lipoproteins and also, presumably, the accumulation of cholesterol in the intimae of arteries. Measures to lower cholesterol have become fundamental to the practice of preventive cardiology, and their use in both patients who already have coronary disease and healthy people has materially contributed to the 50% reduction in mortality from coronary heart disease in the united states (Sempos *et al.,* 1988 ; Johnson *et al.,*1993).

Table 2: Concentrations of some trace elements before cupping and after cupping

Trace Element	Before Cupping	After Cupping			
		Week 1	(p)value	Week 2	(p)value
Zn (µmol/L)	14.19±2.76	16.58±1.39	0.001*	16.10±3.63	0.021*
Cu(µmol/L)	18.12±3.36	17.65±3.00	0.557	17.20±3.24	0.273
Mn (µmol/L)	6.06±1.00	5.93±1.01	0.601	5.72±0.86	0.144
Cu/Zn ratio	1.33±0.39	1.07±0.20	0.002*	1.11±0.32	0.023*

* Significant difference P≤0.05

Serum concentration of Zn, Cu, Mn and Cu/Zn ratio are present in Table 2. Patients with hyperlipidemia who subjected to cupping show a significant increase (p≤0.05) in Zn concentration (16.58±1.39, 16.10±3.63) µmol/L in week 1 and 2 respectively by comparison before cupping (14.19±2.76) µmol/L. The results showed a significant decrease (p≤0.05) in Cu/Zn ratio (1.07±0.20, 1.11±0.32) in week 1 and 2 respectively by comparison before Cupping (1.33±0.39). Non significant decrease in Cu, Mn concentration (17.65±3.00, 5.93±1.01) µmol/L, (17.20±3.24, 5.72±0.86) µmol/L in week 1 and 2 respectively by comparison before cupping (18.12±3.36, 6.06±1.00) µmol/L. The results in Table 3, 4 and 5 represent the correlations of serum trace elements concentrations of measured trace elements with total cholesterol, HDL- cholesterol, LDL- cholesterol, triglyceride and LDL/HDL ratio, showed a significant correlation between Zn concentration and lipid profile before and after cupping.

Table 3 : Correlations of serum concentrations of Zn, Cu and Mn with Lipid profile in serum of hyperlipidemic patients before cupping.

	Zn (µmol/L)	Cu(µmol/L)	Mn (µmol/L)	Cu/Zn ratio
Total cholesterol(mmol/L)	R=-0.581 P=0.001*	R=0.316 P=0.083	R=0.049 P=0.793	R=0.652 P<0.001*
HDL-cholesterol(mmol/L)	R=0.51 P=0.003*	R=-0.333 P=0.067	R=-0.049 P=0.794	R=-0.582 P=0.001*
LDL-cholesterol(mmol/L)	R=-0.571 P=0.001*	R=0.315 P=0.084	R=0.051 P=0.784	R=0.639 P<0.001*
Triglyceride(mmol/L)	R=-0.613 P<0.001*	R=0.359 P=0.048*	R=0.046 P=0.808	R=-0.711 P<0.001*
LDL/HDL ratio	R=-0.566 P=0.001*	R=0.317 P=0.082	R=0.058 P=0.757	R=-0.630 P<0.001*

*Significant difference P≤0.05

Table 4 : Correlations of serum concentrations of Zn, Cu and Mn with Lipid profile in serum of hyperlipidemic patients after cupping (week 1).

	Zn (µmol/L)	Cu(µmol/L)	Mn (µmol/L)	Cu/Zn ratio
Total cholesterol(mmol/L)	R=-0.478 P=0.007*	R=0.252 P=0.171	R=-0.149 P=0.422	R=0.542 P=0.002*
HDL-cholesterol(mmol/L)	R=0.423 P=0.018*	R=-0.290 P=0.114	R=-0.136 P=0.467	R=-0.413 P=0.021*
LDL-cholesterol(mmol/L)	R=-0.237 P=0.198	R=0.256 P=0.165	R=0.150 P=0.412	R=0.313 P=0.087
Triglyceride(mmol/L)	R=-0.495 P=0.005*	R=0.241 P=0.192	R=0.173 P=0.351	R=0.412 P=0.021*
LDL/HDL ratio	R=-0.320 P=0.079	R=0.281 P=0.126	R=0.147 P=0.429	R=0.368 P=0.042*

*Significant difference P≤0.05

Table 5 : Correlations of serum concentrations of Zn, Cu and Mn with lipid profile in serum of hyperlipidemic patients after cupping (week 2).

	Zn (µmol/L)	Cu(µmol/L)	Mn (µmol/L)	Cu/Zn ratio
Total cholesterol(mmol/L)	R=-0.470 P=0.008*	R=0.349 P=0.054	R=-0.092 P=0.621	R=-0.092 P=0.621
HDL-cholesterol(mmol/L)	R=-0.448 P=0.011*	R=-0.173 P=0.352	R=-0.105 P=0.576	R=0.268 P=0.367
LDL-cholesterol(mmol/L)	R=0.513 P=0.003*	R=0.252 P=0.172	R=-0.155 P=0.404	R=-0.204 P=0.272
Triglyceride(mmol/L)	R=0.334 P<0.001*	R=0.304 P=0.097	R=-0.055 P=0.767	R=-0.008 P=0.965
LDL/HDL ratio	R=-0.526 P=0.002*	R=0.241 P=0.192	R=-0.119 P=0.522	R=-0.206 P=0.267

*Significant difference P≤0.05

It is clear that deficiencies of some trace elements, such as Cu, Zn and Mn can result in marked alterations in lipid and lipoprotein metabolism (Cunnane, 1988). To the best of our knowledge, there has been no previous research regarding the correlations of serum trace elements with lipids and lipoprotein in patients treated by Cupping. According to our results serum Cu had no significant correlation with lipid profile. Several studies reported an inverse relation between serum Cu and cholesterol in rats during Cu deficiency (Engle *et al.,* 2000), while (Koo and Williams, 1981) found no significant correlation between the serum cu and cholesterol levels in non cu deficient rats. These findings suggest that the correlations between the serum Cu concentration and lipid levels in the physiological concentration may be different from the changes observed during Cu deficiency (Tajika and Nazifi, 2010), or due to that Cu form complexes with LDL (Lynch and Frei, 1995) and most of this binding apparently involves apolipoprotein B100, the major protein in LDL, and plays a role in lipid peroxidation (Wagner and Heinecke, 1997). According to our results, serum Zn concentration showed a significant increase and a positive correlation with HDL-cholesterol after Cupping, these results confirm the importance of Zn since it is essential for the function of more than 200 enzymes, and Zinc – containing enzymes are found in metabolic pathways involved in lipid metabolism (Cunnane, 1988). A Zinc deficiency induced hypercholesterolemia has been demonstrated in rat and dog models (Cunnane, 1988). Similar to our results (Suliburska *et al*., 2010) found a negative relationship between serum Zn and total cholesterol concentration in human, and (El- Hendy *et al*., 2001) showed that Zn deficiency increases serum cholesterol in a dose-dependent. Manganese is critical for lipid and lipoprotein metabolism, it has been

demonstrated that Mn enhance cholesterol synthesis in the liver, However, our results showed a non significant negative correlation of the serum Mn with lipid profile.

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