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Research Article

Blood biomarkers of hypertensive patients participated in cupping therapy

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ABSTRACT

Due to the side effects of chemotherapy, some practitioners have reverted to the use of traditional medicine as complementary therapy. Several clinical studies have considered the effectiveness of cupping therapy to alleviate several diseases such as the widespread hypertension illness. The purpose of this study is to investigate the impact of cupping on blood, biochemical and hormonal indicators of hypertensive patients. Thirty voluntary male patients (45- 55 years) were chosen. Blood of pre-cupping (PC) and of cupping (CU) was obtained in order to measure blood constituents and biochemical variables. Results showed a significant increase in the concentration of blood cholesterol of CU patients compared with those of PC. The levels of high-density lipoprotein (HDL), low-density lipoprotein (LDL), triglycerides and glucose did not indicate any significant differences between the two groups. Concerning nitrogenous compounds, similarity was recorded in the level of total proteins, albumin and creatinine between the PC and the CU groups, while the urea level showed a clear decrease in CU individuals. On the other hand, the study showed a significant reduction in the levels of white blood cells, red blood cells, hemoglobin and platelets of CU blood. Concerning CU hormones, there was a significant decrease in the concentration of T3 and TSH, but T4 was significantly higher, while no significant change was observed in cortisol level. Cupping may help to reduce systolic pressure and cholesterol from the blood. This process may participate in reducing atherosclerosis, which could facilitate blood flow and reduce pressure on the heart, leading to the relaxation of patients.

Keywords: Blood pressure; biochemical variables; cupping; thyroxine; traditional medicine.

INTRODUCTION

Today, man is living under stress because of the demands of life, leading to many diseases. Among the harms that researchers are concerned with are chronic diseases, which are widespread in the world, such as heart disease, where statistics show that a large number of people die every year of heart attack or stroke, which has become a problem of daily health. In 2004, the disease was classified as the number 1 killer in the world (WHO, 2013). It was reported that 40% of adults over the age of 25 suffer from this disease (WHO, 2012), despite controlling it for treatment and following the advice of doctors (Khatib and El Guindy, 2005). Scientific studies have shown that individuals with hypertension disorder who do not receive treatment are estimated to have stroke and kidney disease 30 to 50 times more often than those who follow treatment (Aboukhetwa, 1992). As these drugs have side effects that increase the patient's suffering, the World Health Organization considers it imperative to seek other treatments (Molla Fathollah, 1928).

A particularly encouraging campaign has begun in developed countries calling for a return to old folk medicine, and has been given the name "complementary medicine". Thus, cupping is a popular remedy that has no side effects, as the patient gets rid of the wastes as in the case with modern drugs (W H O, 2013). In ancient medicine, cupping was considered a mechanism for sanitation for therapeutic purposes. This is due to around 3500 BC, and there are historical documents that show that it was permitted in ancient Europe and the Middle East despite the cultural differences (Molla Fathollah, 1928; Yarmo Hammadi *et al., 2013*). The word cupping means blood sucking (Bandar-Reigy, 2009; El Sayed *et al., 2014*), which is the procedure of scratching and sucking in the capillaries for blood Blood liquefaction (Molla Fathollah, 1928). Cupping has been practiced since ancient times in parts of the world using the wet or dry method, where the latter is a collection of blood without scratches, and the wet method is made by creating small cracks to remove harmful blood and accumulated only under the surface of the skin (Mahdavi *et al*., 2012). Cupping is a scientific method that combines the methods of cleaning with

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sterilization and surgery in order to meet the needs of health care. It is a means of extracting harmful products from the bodies across the surface of the skin, thus helping kidneys, spleen and liver I their functions (Abounaim, 2007). Cupping is a very safe process. It is harmless, painless and free from adverse side effects, but it is very effective for rel ieving pain and stimulating vital functions of the body, as well as for prevention or treatment of certain diseases such as heart problems and cancers, kidney failure, stroke, arthritis, rheumatism physical disability and mental retardation (Abounaim, 2007).

Since cupping has become an important method in our society and has been used as a complementary treatment for blood pressure disease, this research aims to study blood cupping of hypertension patients and compare it with the blood of these patients before the cupping process, and that by measuring some blood, biochemical and hormonal markers.

MATERIALS AND METHODS

The study was conducted in a private clinic specialised in cupping therapy during the period of April -May on 30 men aged between 45-55 years, suffering from high blood pressure and were all under treatment. The work tools were mainly made of new cupping cups, sterile medical blades, surgical sterilizers and an air suction tool, all brought from the pharmacy.

Venous blood of the arm was taken before performing a cupping procedure. Blood samples were withdrawn by a sterile syringe prior to cupping at 8 am, after measuring the blood pressure of each patient.

The cupping blood was obtained after placing the cup in the area of the withers using negative pressure for a few minutes. The cup was then removed and parallel superficial incisions were made using a scalpel. The cup was then returned by the same way, where the blood was sucked into cup until it was full. The operation was repeated three to five times without causing new scratches until the lymph appears instead of blood (Molla Fathollah, 1928; Yarmo Hammadi, 2013; Yarmo Hammadi *et al*., 2014).

All blood samples were placed directly in special polyethylene tubes, which were divided into two groups, one dry and the other containing the anticoagulant EDTA, to measure blood, biochemical and hormonal markers.

Measurement of blood constituents was made by the automatic apparatus (medray), while the biochemical measurement was performed by the automatic device (BTS-370) (Thomas and Labor, 1992). Hormones were performed by the special immuno-enzymatic method (Trinder, 1969) using the apparatus Archetect c I 8200 la boratoire Abbott. Cupping procedure were performed in accordance with the ethical standards within our country.

Results were analyzed using a student t-test by a special program (minitab 13), where blood markers of cupping were compared with those of before cupping. Results are considered significant at $p \leq 0.005$.

RESULTS

Results of table 1 showed a significant increase in the value of systolic pressure before cupping compared to its value immediately after cupping. On the other hand, no significant difference was observed concerning the value of diastolic pressure between the two groups.

Results of the blood and biochemicals markers are presented in table 2.

Results showed a significant increase in cholesterol concentration in cupping blood, while that of triglycerides, the HDH and the LDL were not affected.

The concentration of glucose in cupping blood was slightly lower than in pre-cupping blood. The levels of total proteins and albumin was close between cupping and pre-cupping blood, and there was no significant difference in the concentration of creatinine for these patients. Contrary, results showed that the cupping blood contains a higher concentration of urea compared to its counterpart before cupping.

With regard to blood indicators, the recorded results showed a clear reduction in RBC, WBC and platelets' counts of cupping patients compared to their numbers in pre-cupping individuals. The concentration of hemoglobin was also significantly lower in cupping patients.

Results showed a significant decrease in the concentration of T3 and TSH in the cupping blood compared to its concentration in the pre-cupping blood (Figure 1, 3).

Contrary, there was a significant increase in the concentration of T4 in cupping blood patients (Figure 2). Concerning the level of cortisone, results indicated a slight reduction in the blood of individuals performed cupping (Figure 4).

DISCUSSION

The study of the blood cupping and the pre-cupping patients suffering from hypertension have led to many important findings.

In this study, the value of systolic pressure of patients after cupping was directly improved compared to its value before cupping. This corresponds to what was published about cupping after a clinical study showed an improvement in systolic pressure after 8 weeks of the experiment (Ghod et al.,2016), and similar to previous results confirmed that cupping adjusts systolic blood pressure for a period of four weeks (Zarei *et al*., 2012).

As for lipids, results showed a rise in the level of cholesterol in people who have been cupped compared to non-cupped individuals, which is in line with previous results (Dons'koi et al.,2016), and contrary to another

study, which confirmed that the concentration was not different between patients of the two groups (Aleyeidi *et al*.,2015). While no significant differences were observed in the concentrations of high-density lipids, low-density lipids and triglycerides between cupping and pre-cupping blood, which are consistent with what was previously reported (Aleyeidi *et al*., 2015).

It has been believed that cupping could accelerate cholesterol excretion by activating liver cell secretions, and thus better discharge of cholesterol (Sheikho, 1999). If lipid deposition blocks blood flow in the vessels, clinical and laboratory studies have shown the useful effect of cupping on atherosclerosis, making it a natural and preventive treatment (Aref Abu Al-Fida, 2003).

There was a slight decrease in glucose concentration compared with the pre-cupping blood, and this can be attributed to the fact that individuals do not suffer from an increase in blood glucose level because cupping was performed during fasting. Accordingly, another investigation showed a remarkable reduction of blood glucose of high-blood pressure patients who have been treated with cupping (Aleyeidi *et al*., 2015). However, there has been a clear elevation in glucose concentration after cupping because it was thought that the latter has an effect in increasing cell metabolism (Dons'koi *et al*., 2016). Thus, the presence of glucose in the blood of cupping may be explained on the basis that the body get rid of excess quanti ties along with other harmful substances, so as not to disturb the functions of organs (Sheikho, 1999). It has been reported that cupping can be used to treat patients with low level of blood sugar to induce glycogen breakdown (Aref Abu Al-Fida, 2003).

In this study, total proteins and albumin concentration were almost similar between the two groups of patients. It was found that the augmentation of blood proteins might increase blood acidity, leading to the precipitation of metabolic wastes and so provoke inflammation (Aref Abu Al-Fida, 2003).

For urea, its concentration was clearly lower in cupping blood than in pre-cupping, while serum creatinine levels did not change significantly. In a previous study, blood creatinine concentration did not change in patients who had undergone cupping (Aleyeidi *et al*., 2015). It has been shown that the various organs of the body enjoy recovery and high efficiency after exposure to cupping, the liver becomes more able in metabolizing cholesterol and triglycerides, storing excess sugar, improve the function of detoxification, and protects from kidney failure (Mohammad Al-Zaki, 2010). Some of the theories show that the withdrawal of blood during cupping process is similar to that of an artificial kidney, unlike the natural kidneys that depend on the glomeruli in the filtration, through the cupping process it can filter all the molecules under the high pressure in the site of cupping (El Sayed *et al*., 2013). The presence of urea in the blood of cupping indicates that the wastes resulting from cellular metabolism is raised at the surface of the skin just as it occurs at the kidney as well as (Sheikho, 1999). This corresponds to what was found in previous work, which confirmed that cupping process helps the body to get rid of harmful materials (Aleyeidi *et al*., 2015).

The blood analysis of this study showed a significant decrease in the number of white blood cells of the cupping subjects, as cupping was reported to strength the immune system (Sheikho, 1999). It is known that any scratching in the body triggers the immune system, leading to an elevation in the formation of white blood cells and strengthens the immunity, and also in case of any stress on the body, it alerts the immune system (Al-Shihri, 2006). Some researchers believe that people who experience the cupping have more than ten times the ability of leukocytes to produce interferon, a protein that has a strong anti-viral effect. The number of leukocytes rises after cupping in response to bone marrow activation (Mohammad Al-Zaki, 2010; Abu Al-Nasr, 2014).

There has been a decrease in the concentration of hemoglobin in cupping blood compared to pre-cupping, because hemoglobin elimination is not only at the level of the spleen, but also at the surface of the skin to avoid the occurrence of some diseases (Sheikho, 1999) **.** Infrared radiation showed that oxyhemoglobin was significantly increased during Chinese dry Cupping in people with muscular diseases, along with a decrease in hemoglobin concentration. This treatment augmented the concentration of oxygen in the cupping area to accelerate the tissues repair (Li *et al*., 2016). Research showed that most of red cells extracted by cupping were abnormal and that the proportion of leukocytes was relatively limited, as if the cupping maintains normal blood cells, while the blood gets rid of the abnormal ones (Mohammad Al-Zaki,2010; Abu Al-Nasr, 2014) .

The number of platelets in this study is very little in cupping blood, because what distinguishes the latter is its coagulation, although it is withdrawn in a medium free of air, which made some researchers consider cupping blood differ from venous blood, the latter clots only in the presence of air (Sheikho, 1999). It is known physiologically that platelets contribute to blood clotting to stop bleeding (Dreyfus *et al*., 1992).

Results of the hormonal study showed a decrease in the level of TSH in cupping patients, and it is known that the secretion is according to the needs of the body (Al-Qamati,2005), then it is broken down and excreted by liver and kidneys (Al-Qamati,2005 ; Duron,2006). In contrast, another study showed that the level of this hormone was not affected in patients of high-blood

Table 1: Mean systolic and diastolic pressure of hypertensive patients

	Before cupping	After cupping
Systolic	13.53±1.17	12.82±1.25*
Diastolic	7.65±1.21	7.21±0.69

*: significantly different at p ≤ 0.005.

Table 2: Mean biological parameters of blood pressure patients before and after cupping (n = 30)

Markers	Pre-cupping	Cupping blood
Cholesterol (g/l)	2.029±0.029	2.224±0.326[a]
HDL (g/l)	0.465±0.095	0.433±0.084
LDL (g/l)	1.275±0.252	1.246±0.224
Triglycerides (g/l)	1.435±0.306	1.495±0.322
Glucose (g/l)	1.021±0.146	0.979±0.178
Total proteins (g/l)	71.663±3.80	70±4.02
Albumin (g/l)	48.6±0.371	49.03±2.74
Urea (g/l)	0.371±0.07	0.323±0.077*
Creatnine (g/l)	8.51±1.7	8.19±1.76
White blood cells (10^3)	6.37±1.63	2.176±0.746 *
Red blood cells (10^6)	4.585±0.33	2.957±0.731*
Haemoglobin (g/l)	12.62±1.11	9.51±1.61*
Platelets (10^3)	254.8±51.3	21.8±10.3*

*: significantly different at p ≤ 0.005.

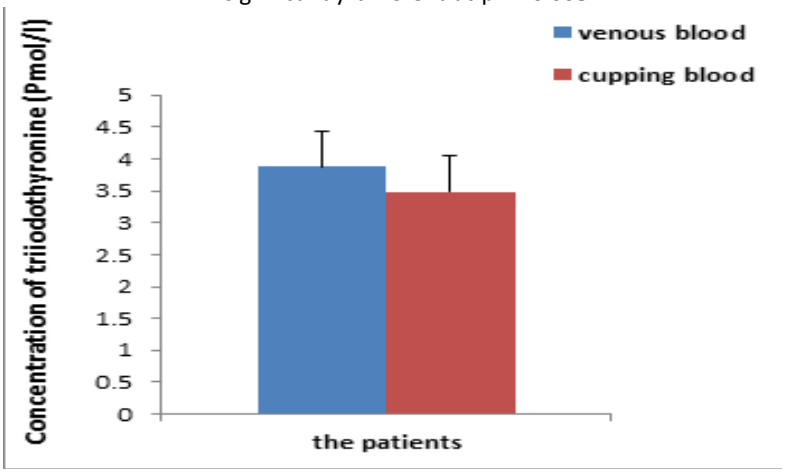

Figure 1: Mean blood level of triiodothyronine (T3) of hypertensive patients before and after cupping (n=30)

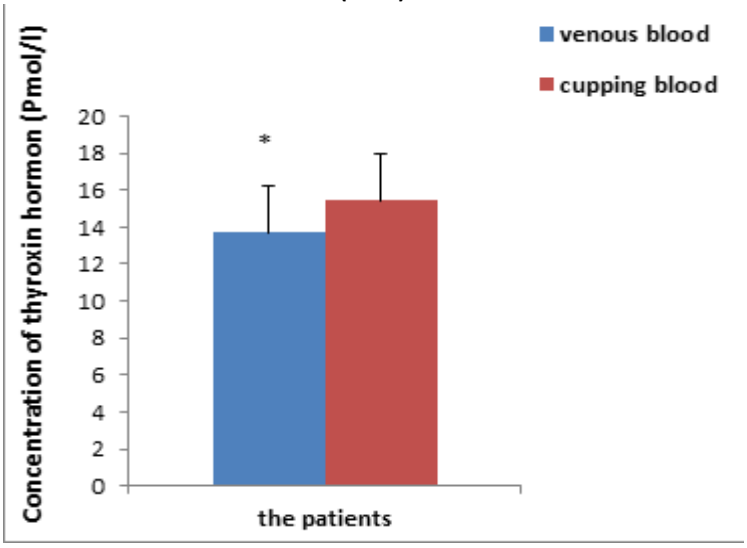

Figure 2: Mean blood concentration of thyroxin (T4) of hypertensive patients before and after cupping (n=30). *: significantly different at p ≤ 0.005.

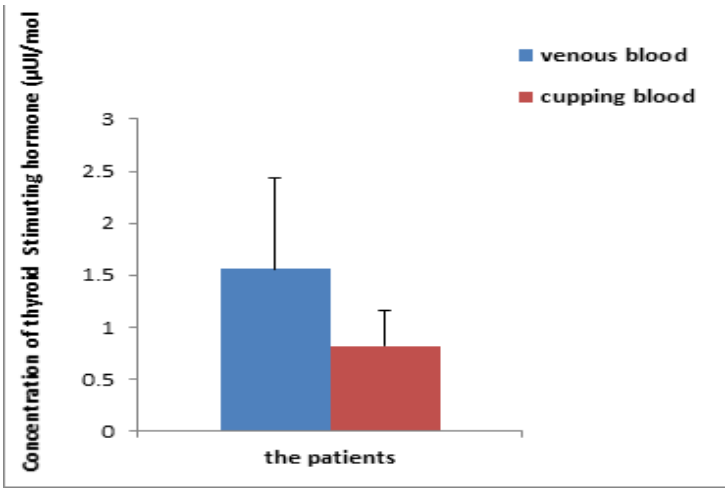

Figure 3: Mean blood concentration of thyroid stimulating hormone (TSH) of hypertensive patients before and after cupping (n=30)

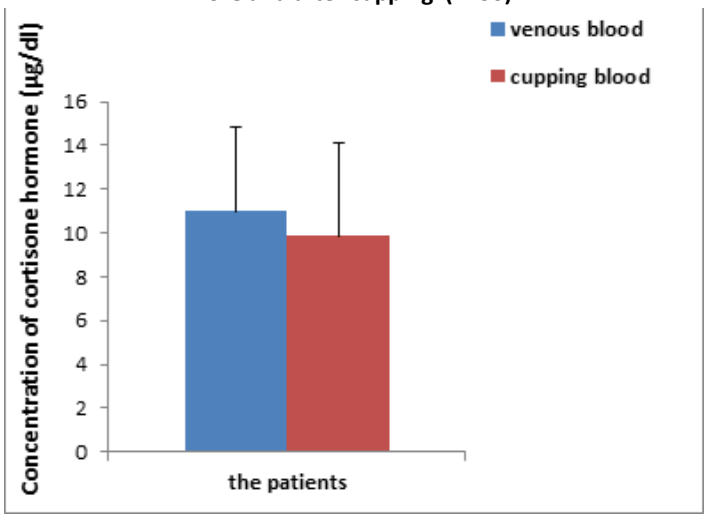

Figure 4: Mean blood concentration of thyroxin (T4) of hypertensive patients before and after cupping (n=30). *: significantly different at p ≤ 0.005.

pressure who have been treated with both drugs and cupping, compared to their counterparts treated with drugs only (Aleyeidi *et al.*, 2015). The same decrease was recorded for T3 hormone, the active form of thyroid hormones. The thyroxin (T4), which represents the inactive form (Al-Qamati,2005), increased in the cupping blood, indicating that the l atter extracted the body from the inactive form of the hormone, while maintaining the active form to raise the energy level by oxidizing sugars and fats. Despite this difference, the values of these hormones remain in the natural ranges in both groups, because patients were suffering from primary blood pressure. Studies have shown that T3 affects muscle contraction, which causes in people suffering from hyperthyroidism, a rise in systolic pressure with a reduction in diastolic pressure (Merce *et al.*, 2005). Results of cortisone did not show any difference between the two groups, which may be due to the same reason that patients suffer from initial pressure. Cortisone secretion in the blood was also found to be affected by the stress of cupping (Dons'koi *et al.*, 2016). Moreover, adrenal cortex hormones was reported to contribute in the regulation of arterial pressure (Hammer and Stewart, 2006). Results of hormonal analysis in this research agree that cupping activates blood circulation, which leads to increased effectiveness of different organs, resulting in the rearrangement of hormonal secretion (Al-Shihri, 2006).

CONCLUSIONS

The obtained results showed some differences in the blood components of pre-cupping and cupping patients suffering from high blood pressure. Cupping blood contained harmful substances such as urea and cholesterol, in addition to T4, the inactive form. It also contained very low levels of blood constituents such as white blood cells and platelets. It can be concluded from this study that cupping may contribute in erythropoiesis stimulation, immune boosting, hormonal regulation and energy promotion, leading to reduced blood pressure. Further research is needed to know the level of biological variables of post-cupping patients.

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