



Evaluation of the effect of wet cupping on blood pressure and some blood parameters in hypertensive patients in Sirte city.

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ABSTRACT

Cupping is an olden method that is at this time used as an alternative treatment for a wide variety of medical conditions. It has traditionally been used in various cultures and popular treatment in Arab and Islamic countries to relieve pain, removing toxins, and improving blood circulation. This study aimed to evaluate the effectiveness of wet cupping and to confirm its role in positively affecting patients with hypertension in some of their blood parameters. 18 samples of patients with hypertension, aged between 21-62 years (10 males and 8 females) who visited the Modern Medical Cupping Center in Sirte were used in this study. Samples were collected from December 23, 2023, to January 25, 2024. Blood samples were collected from the veins of patients before and after cupping (10 days after the cupping). Two blood samples were collected from each patient, and serum samples were tested for blood parameters and biochemical indicators, including hemoglobin (HGB), red blood cells (RBCs), white blood cells (WBCs), platelets (PLT), creatinine (CREA), urea (BU), triglycerides (TG), blood glucose (BG) and cholesterol (CHOL). Additionally, blood pressure measurements were also taken before and after cupping.

The results presented a decrease in both blood systolic and diastolic pressure after cupping in both males and females, with statistical significance observed in males. There was a significant decrease in urea, cholesterol, triglyceride, and blood sugar levels in male patients after cupping ($P>0.05$), but an increase in platelet count after cupping. In female patients, cholesterol and blood sugar levels also decreased compared to pre-cupping values, with a higher MID% observed after cupping. In brief, cupping can be considered an alternative treatment method to medications through its role in regulating blood pressure and glucose levels, thus reducing the risk of heart and arterial diseases..

1 Introduction

Cupping, or Al Hijama is one of the ancient therapeutic methods that have been used since ancient times to treat many diseases, and its use has become common now in several countries, especially Arab countries. Cupping used as a treatment is divided into two types: wet cupping and dry cupping. Wet cupping is considered the most used by patients which is believed to be due to its rapid therapeutic response. It is used by making incisions, and the cups are placed on the painful sites by using hand pump suction in different areas of the body (light and small scratches with a razor blade). Dry cupping is used without making any incisions in the cupping areas, the cups are placed on the painful sites by using hand pump suction in several different areas; of the body to collect blood in the treated area (Mahdavi *et al.*, 2012).

Many studies have shown that cupping in general has an effective role in treating many diseases, for example; muscle pain and inflammation, arthritis and gout, lower back pain, chronic non-specific neck pain and cervical spondylitis, gynecological disorders, and other diseases (Lee M *et al.*, 2011; Cao *et al.*, 2010; AL-Shamma and Abdil Razzaq 2009). Furthermore, cupping has been found to have a good effect in reducing levels of cholesterol in the blood of patients with hyperlipidemia (Fikri Z *et al.*, 2017).

It has been observed that cupping can reduce the count of lymphocytes and increase the count of neutrophils in the local blood in the treated area and this mechanism may be one of the mechanisms that reduces the severity of pain as an antiviral (Hao *et al.*, 2016).

Hypertensive and diabetes are chronic and common diseases that greatly affect overall health, and these diseases can result in complications and serious health disease for instance heart problem, blood vessel diseases, kidney failure, and stroke. One of the most serious aspects of hypertension is that it has no specific symptoms to identify it, which makes it difficult to diagnose. Cupping is often used as one of the most common methods used by hypertensive patients to lower blood pressure and relieve symptoms such as headaches and stress (Zarei *et al.*, 2012; Aleyeidi *et al.*, 2015) (Ahmadi *et al.*, 2008; Kim and Yount 1974). Although cupping therapy is still a popular method, its effectiveness on most diseases, including hypertension, has not yet been scientifically evaluated.

Some studies have suggested that cupping, especially wet cupping, may help lower blood pressure in hypertensive patients by improving blood circulation and decreasing stress. In addition, some limited research has suggested that wet cupping may help control blood glucose levels for sensitivity and glucose

metabolism. It has been shown by Fikri *et al.*, 2017 that using cupping show an effect on decreasing total levels of blood cholesterol in high blood cholesterol patients. Cupping has recently become a primary method used as a complementary treatment for high blood pressure. This study aims to study wet cupping for high blood pressure in patients before and after cupping in Sirte, by measuring some blood and chemical indicators.

2 Materials and Methods

In this study, 18 samples of patients with hypertension (10 males and 8 females) who visited the Modern Medical Cupping Center in Sirte were used. The samples were collected in the period from December 23, 2023, to January 25, 2024.

The patients in this study were males and females aged (21 to 62 years), and this information was collected through a questionnaire. The average age of females was 37.3529 ± 2 . The average age of males was 42.4118 ± 2.75 . Blood samples were used with patients' permission and ethical approval.

A blood sample was drawn before wet cupping, and the blood tests used in this study were performed. Ten days after the first draw, a second blood sample was drawn from the same patient, and different tests were performed for each blood draw from the patients. Patients were given a questionnaire containing a set of questions to collect information about them, and from the questionnaire, patients were diagnosed with hypertension clinically by a doctor. Blood samples were taken from people who frequently visit the cupping center, and it was found through a questionnaire that these people were exposed to high blood pressure after measuring their blood pressure and showing symptoms of high blood pressure, and these people use alternative medicine through cupping for fear of high blood pressure and to protect themselves from the side effects of high blood pressure.

All patients agreed to allow blood collection from them. Pregnant or lactating subjects and patients with severe heart, liver, kidney disorders or chronic diseases were excluded from the study.

Blood samples were collected from the veins of patients before and after 10 days of the cupping session. Two blood samples were taken from each patient and taken to Al-Reem Laboratory in Sirte City to conduct the necessary blood tests.

The cups are placed on the patients' back area, especially under the neck and the area below the shoulder blade. The wet cupping was performed by making an incision in the skin with a surgical scalpel where the cup was placed. This removes the superficial

blood that flows into the cup. A suction pump was used to pump air out of the cup after it was placed on the skin.

Moreover, the blood pressure of the study patients was measured before and after cupping therapy.

2.1 Hematological and biochemical parameters

Serum samples were tested for hematological parameters and biochemical parameters. For biochemical tests, blood samples were kept at room temperature until they clotted, then placed in a centrifuge to separate the serum, the serum samples were tested for blood parameters including blood glucose (BG), blood urea (BU), uric acid (UA), creatinine, cholesterol (CHOL) and triglycerides (TG) by 4040 nm photometer.

The blood was drawn into tubes treated with EDTA to determine the blood parameters.

For the complete blood tests hematological parameters were measured by using automatic hematology analyser (Samasung labges PT10 Lipid test) including white blood cell count (WBC/ μ l), red blood cell (RBC/ μ l), hemoglobin level (g/dl) (HGB), Platelets counts (PLT/ μ l), PCT%, hematocrit percentage (HCT%), lymphocyte levels (LYM/ μ l), lymphocytes

percentage (LYM %), Granulocyte (GRA/ μ l) include neutrophils, monocytes, eosinophils, and basophils, (GRA %), (MID) mid-sized white blood cells and (MID%), mean corpuscular volume (MCV (fl)), Platelet large cell Coefficient (P-LCC).

Statistical analysis

The results are presented as the mean \pm standard Error and were analyzed by paired sample *t*-tests using SPSS, and data were considered statistically significant at *p*-values <0.05 .

3 Result

3.1 Systolic and diastolic blood pressure

According to the data shown in **Figure 1**, male patients after cupping showed a decrease in systolic blood pressure ($P > 0.00$) (A) and diastolic blood pressure ($P > 0.001$) (B) and were significantly affected by cupping. However, as shown in **Figure 2**, female patients after cupping appeared to have decrease in systolic blood pressure (A) and diastolic blood pressure (B) but not significantly.

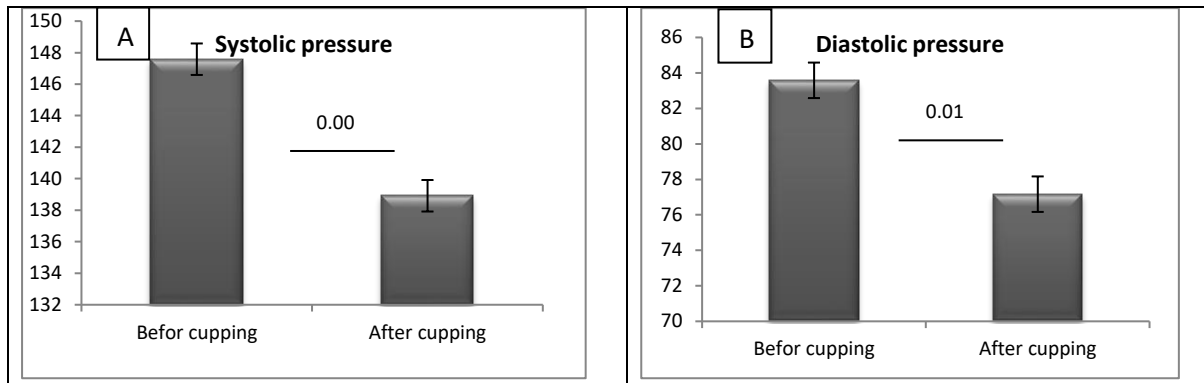


Figure (1): Shows the mean blood pressure (A) systolic and (B) diastolic before and after cupping in **male** patients (all values are expressed as Means \pm SE).

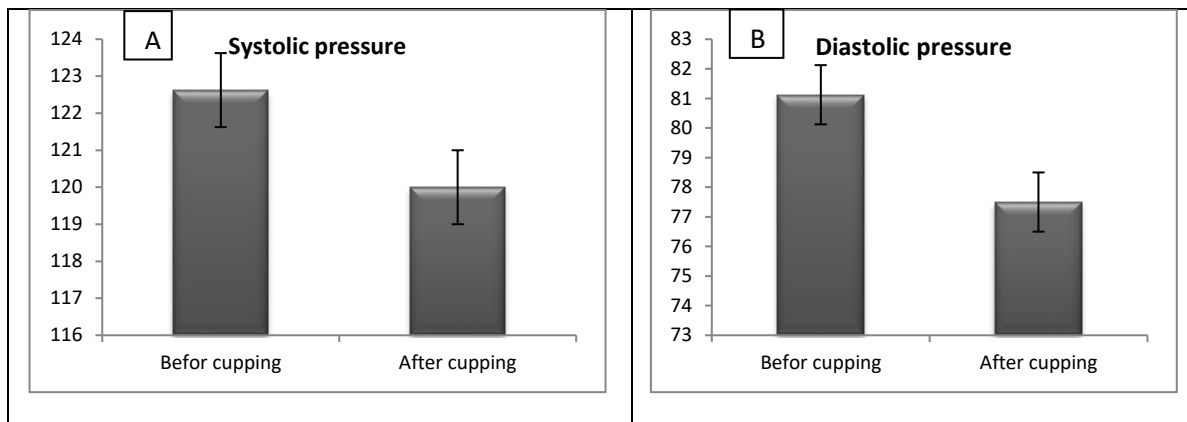


Figure (2): Shows the mean blood pressure (A) systolic and (B) diastolic before and after cupping in **female** patients (all values are expressed as Means \pm SE).

3.2 Hematological parameters

Hematological parameters, including red blood cell count, white blood cell count, hemoglobin level, and platelet count, were observed before and after cupping.

The mean white blood cell count, red blood cell count, hemoglobin, and platelets of patient women before and after cupping are presented in **Figure 3**. As shown in the figure, WBC (A) count, RBC count (B) and HGB (C) had no statistically significant differences before and after cupping. However, after cupping, PLT (D) was decrease, and was statistically significant ($p= 0.05$).

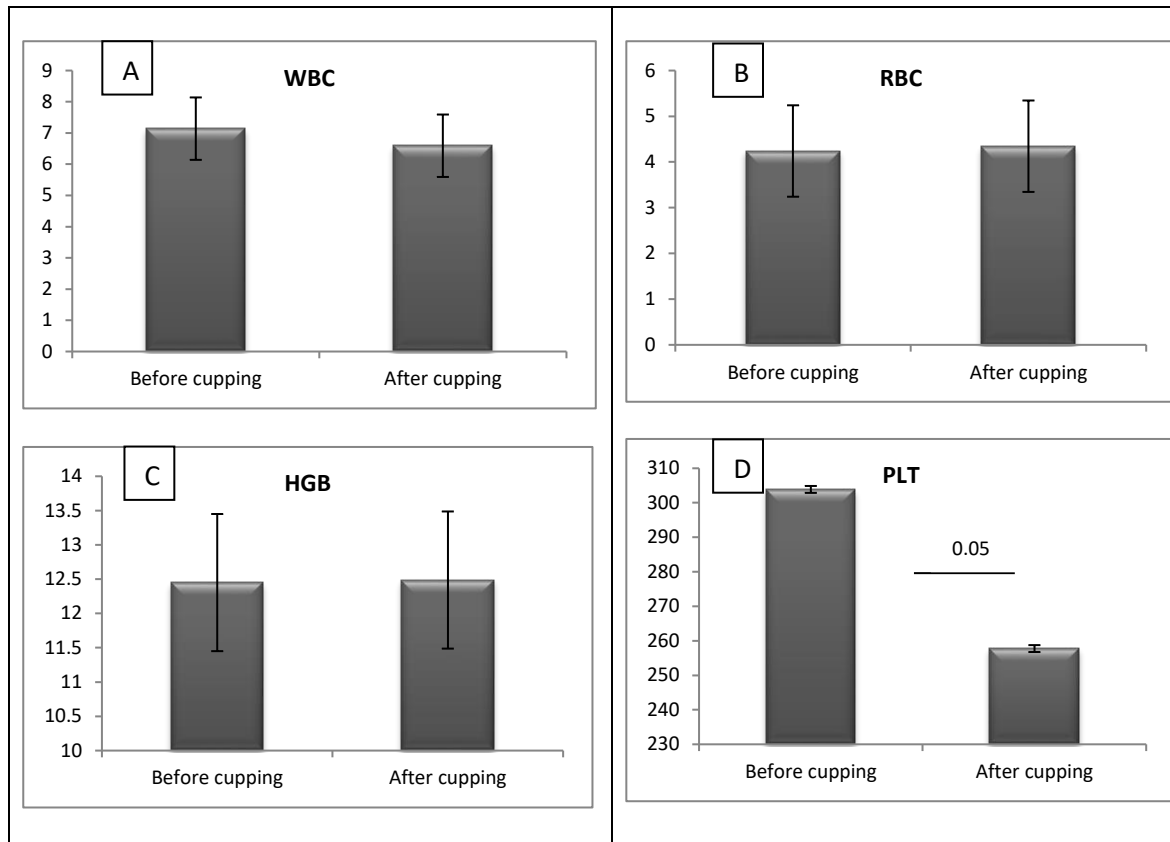


Figure (3): Shows the mean white blood cell count, red blood cell count, hemoglobin, and platelets before and after cupping in female patients (all values are expressed as Means \pm SE).

As shown in **Table 1**, white blood cell parameters (Lymph, MID, Gran, Lymph %, and Gran %) appeared statistically slight different, but there were no significant differences between pre-cupping and post-cupping in females. However, higher levels of MID and MID% after cupping compared to post-cupping were shown and were statistically significant in MID% ($p = 0.043$). Both higher levels of MID and MID% indicate that the body is fighting an infection, allergic reaction, or chronic inflammatory condition and certain medical conditions such as high blood pressure.

Women after cupping showed a decrease in PLT, PLCC, and PCT% of platelets, and a decrease in MCV of red blood cells, however, there was no statistically significant difference compared to after cupping, and no change in HCT% was shown.

Table (1) Effects of wet cupping on blood cell parameters LYM,LYM%, MID, MID%, GRA, GRA%, PLCC,PCT%,HCT%, MCV in female patient before and after wet cupping. (The values are show as Means \pm SE).

Parameters	Before cupping	After cupping	P-Value
LYM	2.1838 \pm 0.278	2.283 \pm 0.2976	0.76
MID	0.17 \pm 0.04	0.21 \pm 0.04	0.39
GRA	5.43 \pm 1.14	4.15 \pm 0.43	0.26
LYM%	31.2626% \pm 3.964	34.0375% \pm 3.50219	0.48
MID%	2.275% \pm 0.691	3.175% \pm 0.664	0.043
GRA%	66.4375% \pm 4.36	60.4% \pm 3.98	0.23
PLCC	120.62 \pm 10.906	105.25 \pm 11.615	0.198
PCT%	0.35% \pm 0.02	0.2875% \pm 0.02	0.12
HCT%	36.136 \pm 0.642	36.391 \pm 0.659	0.700
MCV	85.375 \pm 1.084	83.875 \pm 0.548	0.203

The mean triglycerides, cholesterol, uric acid, and blood glucose of female patients before and after cupping are presented in **Figure 4**. As shown in the figure, TG level (A) appeared lower after cupping, but there was no statistically significant difference. CHOL level (B) decreased after cupping, and there was a statistically significant difference ($p=0.02$). Moreover, the blood glucose level (D) decreased after cupping, and there was a statistically significant difference ($p=0.02$). However, the uric acid level (C) showed no significant difference before and after cupping.

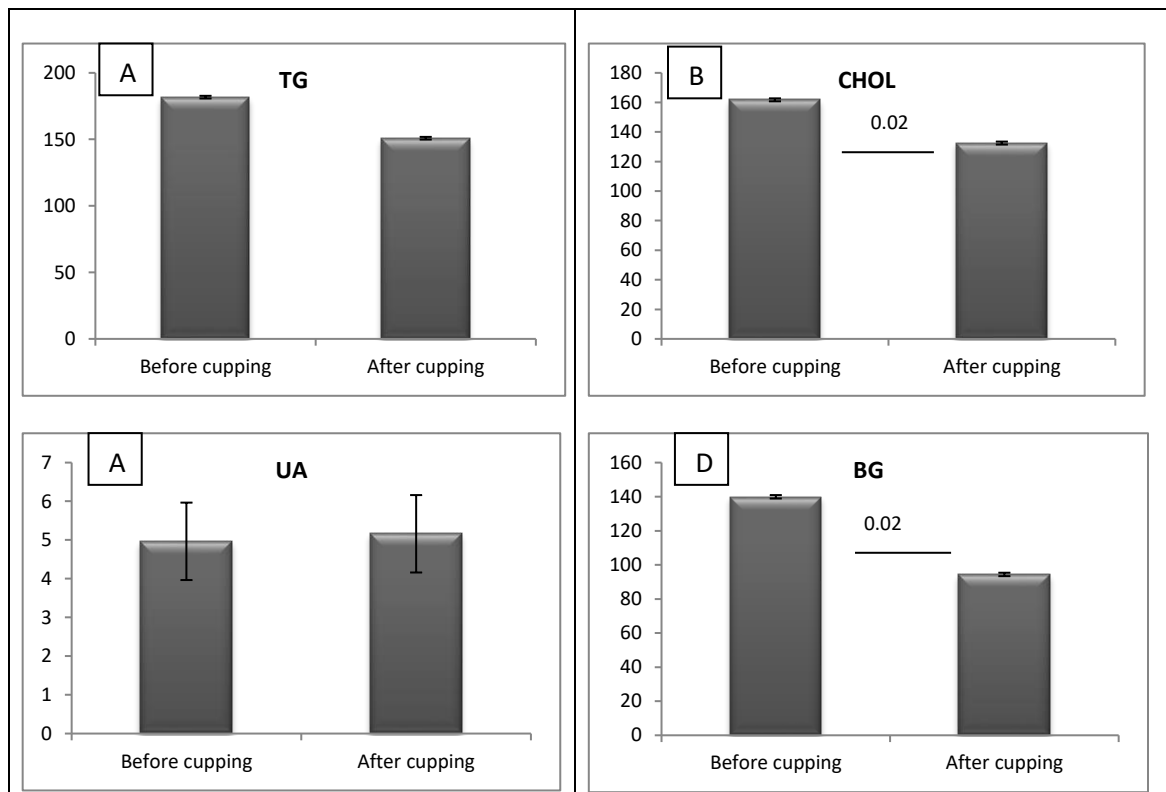


Figure (4): Shows the mean triglycerides TG, cholesterol CHOL, uric acid (UA), and blood glucose BG before and after cupping in female patients (all values are expressed as Means \pm SE).

The mean white blood cell count, red blood cell count, hemoglobin, and platelets of male patient before and after cupping are presented in **Figure 5**. As shown in the figure, WBC (A) count, RBC count (D) and HGB (C) there were no statistically significant difference before and after cupping. However, after cupping PLT (B) was decrease and was statistically significant ($p=0.05$).

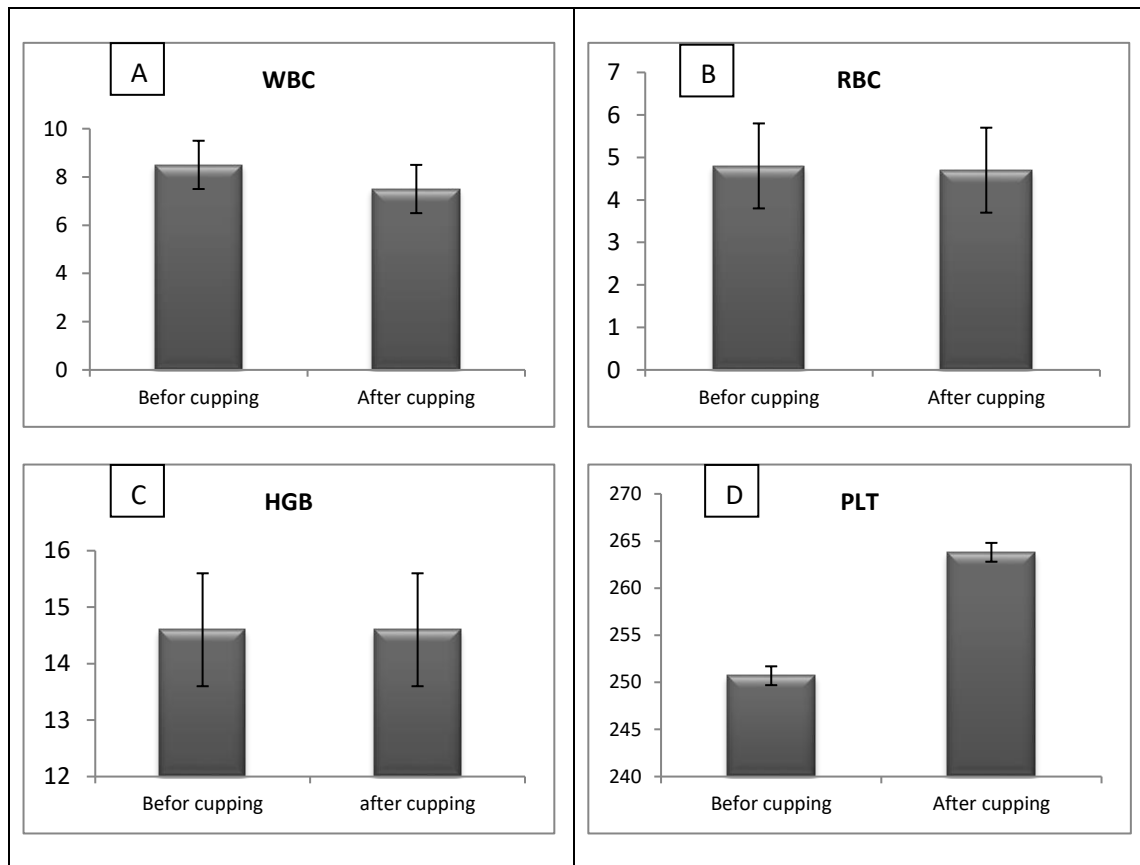


Figure (5): Shows the mean white blood cell count, red blood cell count, hemoglobin, and platelets before and after cupping in **male** patients (all values are expressed as Means \pm SE).

The mean triglycerides, cholesterol, uric acid, and blood glucose of male patients before and after cupping are presented in **Figure 6**. As shown in the figure, there were decreased levels of TG and CHOL after cupping, and there was a statistically significant difference in TG level (A) ($p=0.001$) and CHOL level (B) ($p=0.006$). Moreover, the blood glucose level (D) decreased after cupping and there was a statistically significant ($p=0.01$), the uric acid level (C) showed significant difference before and after cupping ($p=0.03$).

In addition, there was a decrease in creatinine levels in males ($p=0.01$) after cupping (0.58 ± 0.07) compared to before cupping (0.63 ± 0.07), but not in females.

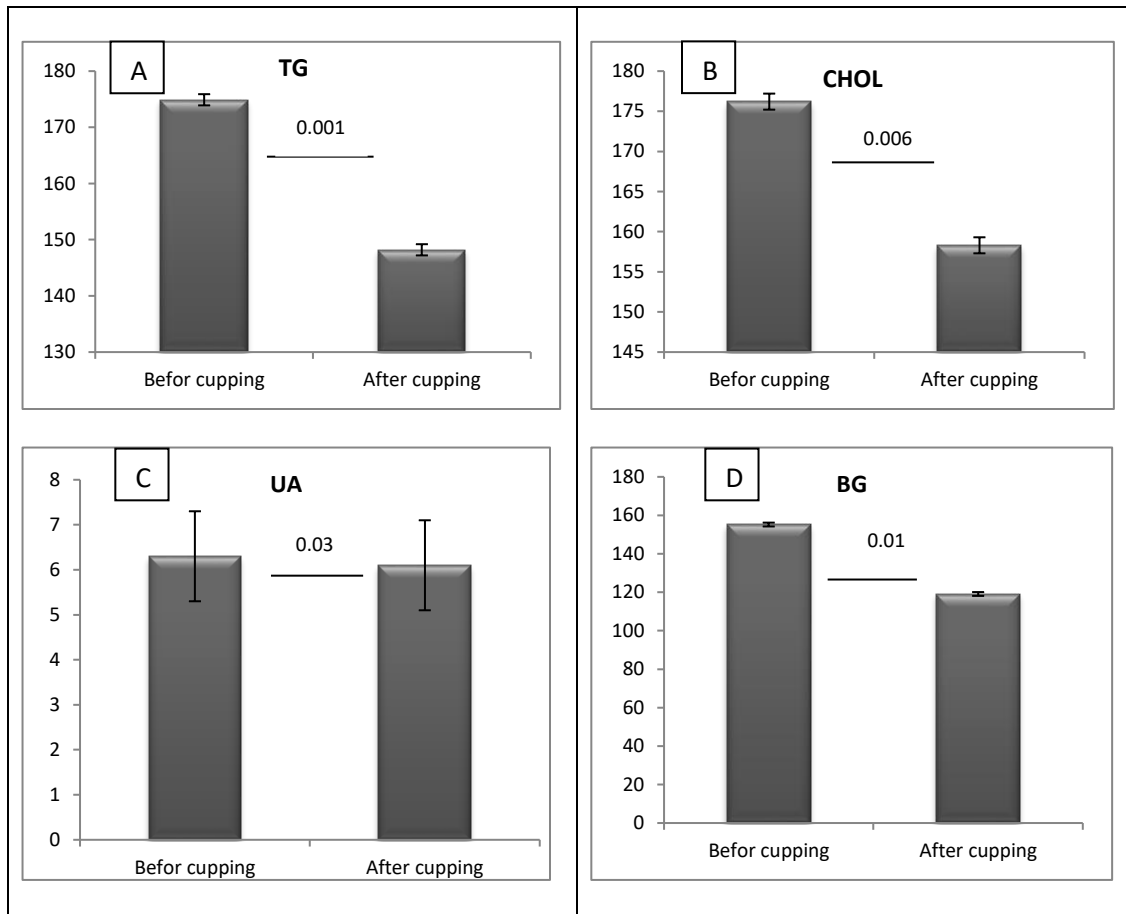


Figure (6): Shows the mean triglycerides TG, cholesterol CHOL, uric acid (UA), and blood glucose BG before and after cupping in male patients (all values are expressed as Means \pm SE).

4 Discussion

Wet cupping therapy is a traditional and popular alternative treatments that requires more scientific explanation regarding its therapeutic mechanisms.

The results of the current study show a positive effect of cupping on blood pressure levels, with a noticeable and statistically significant decrease in systolic and diastolic blood pressure for males, and also decrease in females but was not statistically significant after ten days of cupping. Blood pressure levels were studied by Al-Zawi *et al.* (2022) and measured systolic and diastolic pressure 30 minutes after cupping, and observed a decrease in blood pressure levels after cupping. Therefore, cupping can be considered a useful complementary treatment method for high blood pressure and prevention of risk factors associated with cardiovascular diseases. additionally, a study by Aleyeidi *et al.*, (2015) showed that wet cupping treatment is effective in reducing systolic blood

pressure in hypertensive patients for up to 4 weeks, without serious side effects. This study also agreed with a study conducted by Alshowafi (2010), where showed a significant decrease in blood pressure after 10 days of cupping compared to the baseline in both systolic and diastolic.

The effect of cupping on white blood cell count, red blood cell count, and hemoglobin in both males and females was slight, with no significant changes observed. In females, white blood cell parameters (Lymph, MID, Gran, Lymph %, and Gran %), showed slight statistical differences, but no significant differences between pre- and post-cupping. However, a higher MID% level after cupping compared to before cupping were statistically significant. The rise in this level indicates that the body may be attack of infection, allergic reactions, a chronic inflammatory condition, and some medical conditions such as high blood

pressure, this is consistent with the observations by Alhenshery *et al.*, (2024). Platelet counts decreased in females after cupping, and were statistically significant ($p = 0.05$). In males, platelet counts increased after cupping with no significant difference was shown compared to before cupping ($p = 0.07$). Females had higher platelet counts than males, consistent with finding in study by Gaetano *et al.*, (2022) that showed females had more platelet counts than males. The increase in platelet counts after cupping in this study was consistent with the study by Kolahi *et al.*, (2015), also the study by Ahmed *et al.*, (2022), but was not statistically consistent with the changes in hemoglobin, red blood cells, white blood cells, hematocrit level, or lymphocyte counts.

A study using wet cupping showed a significant decrease in mean blood pressure and counts of white blood cells, neutrophils, and monocytes 10 minutes before and after cupping procedure (AL-Shamma and Abdil Razzaq 2009).

This study shows no changes were observed in white blood cell counts and red blood cell counts before and after wet cupping therapy. This is consistent with the findings in study by Rahman *et al.*, (2020) and Ranaei *et al.*, (2010), which confirmed that cupping does not effect on complete blood counts, white blood cell counts, or red blood cell counts. This suggests that blood loss resulting from cupping therapy was minimal and did not pose a health risk to either males or females.

High blood cholesterol is considered one of the greatest important risk issues for heart and blood vessel diseases. Although the current study samples in both sexes did not suffer excessively high blood cholesterol concentration, wet cupping played a positive role in improving blood cholesterol concentration, wet cupping significantly reduced the cholesterol as the average cholesterol level in females decreased after cupping compared to before cupping ($p=0.02$) there was a statistically significant difference. Likewise, in men, cholesterol concentration decreased significantly after cupping ($p=0.006$). This result has been proven in previous studies by Sutriyono *et al.*, (2019) and Mustafa *et al.*, (2012). In men, after cupping, triglycerides and blood sugar levels decreased significantly and remained low for two months (Refaat *et al.*, 2014).

Furthermore, in addition to reducing cholesterol, wet cupping also significantly reduced triglyceride, blood sugar, urea, and creatinine levels, as well as cholesterol. This observation was consistent with finding in study conducted by Rahman *et al.* (2020) before and 72 hours after cupping therapy. The same were observed in study by Allafi and Al-Haifi (2020), using females blood

samples showed that serum levels of cholesterol and blood glucose were decreased after cupping, moreover systolic and diastolic blood pressure after cupping was significantly reduced.

The differences concluded in this study are evidence of the therapeutic effects and effective function of wet cupping according to the different locations of the body, as cupping can prepare the immune white blood cells, create inflammation at the cupping site, get rid of exhausted red blood cells, improve good blood circulation to the tissues and organs, reduce cholesterol and triglyceride levels, which improves the cases of weakness and raises immunity, and thus has a major role in protecting the body from several diseases.

5 Conclusion

This study suggests that wet cupping therapy may serve as a complementary or alternative treatment for controlling blood pressure and triglyceride levels in hypertensive patients. Scientific research supports the effectiveness of wet cupping in reducing systolic and diastolic blood pressure in patients with high blood pressure after ten days. Therefore, wet cupping should be considered a complementary treatment for high blood pressure, as it has a good and effective effect on patients without any serious side effects. Further studies on wet cupping are needed to explain the mechanisms of its effect on the body.

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