



Effect of Wet Cupping in Serum Liver Enzymes in Obese Women with Non Alcoholic Fatty Liver

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Abstract :

Objective: to explore the effect of wet cupping on obese women who have nonalcoholic fatty liver. To assess its utility as a simple, low-cost approach. And to establish how much Cupping treatment is effective in improving liver enzymes in NAFL patients.

Methods: Blinded randomized controlled trial, whereas 60 of class one obesity women who were diagnosed with increased liver enzymes who shared and equally distributed to double collections, the first collection (cupping group) includes 30 of obese women with Non -alcoholic fatty liver undergoes wet cupping procedure and the second collection (control group) includes 30 of obese women with Non -alcoholic fatty liver but not faced undergoes wet cupping procedure. With evaluation of the liver functions.

Results: The assessed parameters along with the research's positive as well as negative findings showed the following: the wet cupping procedure had significant effect on lowering liver enzymes levels as ALT, AST, ALP, GGT, and BILI whereas ($p > 0.001$). The proportion of decline in ALT, AST, ALP, GGT and BILI in group A was 20.31, 13.21, 10.95, 18.08, 20% respectively, and that of group B was 7.07, 5.17, 4.26, 3.59, 5.75% respectively.

Conclusion: Wet Cupping Therapy improved hepatic enzymes in overweight females with nonalcoholic fatty liver.

Keyword: Cupping Therapy, Non Alcoholic Fatty Liver, Obese women.

1. Introduction:

Non-alcoholic fatty liver disease (NAFLD) is occasionally expressed as the liver presentation of the metabolic syndrome that is characterized by presence of three disorders from these symptoms: elevated blood pressure, increased glucose level, overweight of the abdomen, elevated plasma TGs, and decreased plasma high-density lipoproteins (1)

The deposition of excess fat in the liver without a history of high alcohol usage distinguishes nonalcoholic fatty liver disease (2).

Obesity is defined as the extreme or atypical deposition of fat or adipose tissue in the body, which can be harmful to one's health. Obesity has become an epidemic that has gotten worse over the previous 50 years (3).

The disease of Non-alcoholic fatty liver is a public chronic hepatic metabolic disorder that affects people all over the world. Obesity affected up to 70%-80% of NAFLD patients (4). NAFLD was found in more than 50% of obese females (5).

Hyperinsulinemia and iron promote increases the adipocyte lipolysis and circulating free fatty acids (FFAs), and then absorbed by hepatocytes and initiate a variety of delicate metabolic processes that result in NAFLD (6).

Cupping (Hijama) is a conventional procedure that involves producing a vacuum over specific parts of the skin, resulting in a minor visible hematoma. There are 2 systems of cupping: dry cupping and wet cupping: the dry cupping includes direct suction stimulation of the skin, whereas wet cupping additionally entails laceration of the skin to remove blood from dermal microcirculation (7).

Cupping therapy utilizes simple procedures such as sucking cups to apply negative pressure to the skin. The sucking and scarification processes are followed by the excretion of causative pathogenic compounds from the interstitial fluid and blood in the skin capillary network in this approach (8).

This can enhance the venous drainage, tissue perfusion, cellular oxygenation, local and systemic circulations, and blood clearance (9)

According to studies, increased blood ferritin levels, a typical sign of iron storage, result in the formation of free radicals and insulin resistance in the myocytes of adipose tissue. Studies have revealed that iron removal by phlebotomy improves insulin resistance and liver enzymes in NAFLD patients with normal blood ferritin and transferrin levels (10).

In contrast to Hijamat, phlebotomy entails using a knife to slice one of the body's superficial veins and withdrawing blood from the patient (11).

2. Patients and Methods :

Design: This randomised controlled research was conducted between July 2021 and January 2022, on 60 obese women attending to chosen from outpatient internal clinic in zagazig general hospital in zagazig city during the time of the study.

The chosen participants were splitted into double collections (**figure 1**): the first had NAFL and faced wet cupping with no using liver Enzymes lowering drugs. And the second also had NAFL and faced No wet cupping with no using liver Enzymes lowering drugs.

Patients included in the study were Obese females who aged from 45 to 55 years, diagnosed with Non-Alcoholic fatty liver, Non-anemic , With suitable history, suitable general and local exams and accepted liver ultrasound and suitable laboratory results. And Diabetic not more than 10 years (whereas their HbA1c value between 6.5 - 7.7).

Except the ones who had Hypertension, Hemoglobin 10 grams per deciliter, high grade body temperature (>37.5) , Cardiovascular diseases as(heart disease, coronary disease, stroke, heart failure ,arrhythmia &heart valve disorders), Viral

hepatitis B or C infection, Celiac disease, kidney disorders, alcohol consumption or corticosteroids consumption , cancer, jaundice and autoimmune hepatitis.

The ethical review board of Cairo University's physical therapy collage had given the study permission to start. Provided written, informed consent from all the participants, whereas the experimental procedures and potential risks were fully explained to the patients before the beginning of the study. No., of approval is : P.T.REC/012/003227.

Diseased persons were randomly divided into two equal groups (A and B). Recording data sheet: Each patient's name, age, gender, HbA1c level, and ultrasound imaging results were all documented on the recording data sheet for this study. Throughout the course of the therapy, the participants were instructed to report any negative side effects.

Procedures of the study: A clinical examination was done on all patients, including assessment of blood pressure (BP) and temperature.

Measurement method: Liver enzymes have been evaluated for all diseased persons in both collections before and after therapy by blood analysis.

Therapeutic procedures: There are five steps that can be taken throughout each 20-minute cupping procedure.

The first step: is to place a suitable-sized cup on the selected site (both scapula at the inferior angle of the scapula (T7), both lumbar regions (L2,L5), and the technician manually suctions the air inside the cup. Following that, the cup is placed on the skin and left there for three to five minutes.

The second step: involves puncturing or scarification. Surgical Scalpel Blade No. 11-15 is used to make superficial cuts in the skin.

The third step involves blood removal and suction. For three to five minutes, the cup is reapplied to the skin using the same technique as before. On average, a total quantity of 50 ml of blood was collected from each patient (**Niasari et al., 2007**) (12).

The fourth step involves the cup removal.

The fifth step involves washing and sanitizing the punctured skin place and clothing it. Each participant received 125 cc of fruit juice once the cupping therapy was finished, and blood pressure measured 30 minutes later for each session.

Blood was obtained and blood pressure was checked before the procedure started. Another blood pressure reading recorded half an hour after the wet cupping session ended. Another blood sample was taken from the individuals after 48 hours.

3-Statistical analysis:

Descriptive statistical analysis will be used for data collection to calculate means and standard deviations. Differential statistical analysis will be

used in the form of paired t-test to detect difference with the same group. Unpaired t-test will be used to detect difference between different groups. P- Value will be considered significant at $p < 0.05$. All statistical measures were performed through the statistical package for social studies (SPSS) version 25 for windows.

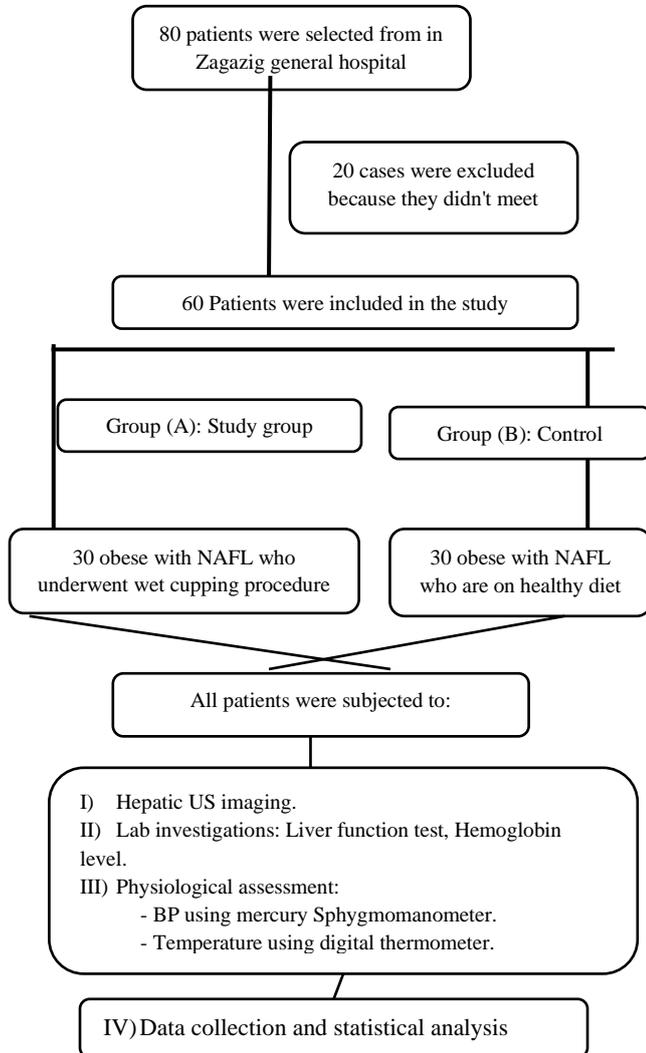


Figure 1: Study design

4. Results:

Candidates characteristics: From the measured variables of the shared persons of the trial revealed that:

No remarked changes among the studied candidates related to age, BMI and HbA1c ($p > 0.05$). (Table 1).

Effect of treatment on ALT, AST, ALP, GGT and BILI:

- Within group comparison:

There was a significant decrease in ALT, AST, ALP, GGT and BIL-I post treatment in group A and B compared with that pre-treatment ($p < 0.001$). The percentage of decrease in ALT, AST, ALP, GGT and BIL-I in group A was 20.31, 13.21, 10.95,

18.08, 20% respectively, and that of group B was 7.07, 5.17, 4.26, 3.59, 5.75% respectively (Table 2).

- Between groups comparison:

There was no significant difference between groups pre-treatment ($p > 0.05$). Comparison between groups post treatment revealed a significant decrease in ALT, AST, ALP, GGT and BILI of group A compared with that of group B ($p < 0.05$). (Table 2).

Table 1. Candidates characteristics.

	Group A	Group B	MD	t-value	p-value
	Mean ± SD	Mean ± SD			
Age (years)	50.86 ± 3.18	49.8 ± 3.25	1.06	1.28	0.2
BMI (kg/m ²)	32.3 ± 1.74	32.1 ± 1.93	0.2	0.42	0.67
HbA1c (%)	7.05 ± 0.37	7.17 ± 0.4	-0.12	-1.24	0.21

SD, standard deviation; MD, mean difference; p-value, level of significance

5. Discussion:

According to the current study, there are no apparent differences between the groups of the research regarding age, BMI and HbA1c.

The research was done to define the influence about cupping therapy on liver enzymes in patients with NAFL. According to these results, it could be concluded that there was a significant decrease in ALT, AST, ALP, GGT, and BILI post treatment in groups A and B compared with those before treatment ($p > 0.001$). The percent decrease in ALT, AST, ALP, GGT, and BILI in group A was 20.31, 13.21, 10.95, 18.08, and 20%, respectively, and that of group B was 7.07, 5.17, 4.26, 3.59, and 5.75%, respectively.

The findings of this study corroborated by (10) who investigated the phlebotomy had a significant positive effect on liver enzymes ($P < 0/0001$). A paired t-test revealed that after six months of phlebotomy ALT, AST, and ALP decreased significantly from baseline. Nevertheless, Hijama might be better than other methods of excretion, such phlebotomy. Hijama rarely results in anaemia, unlike phlebotomy since blood cells are not filtered via capillary pores.

A significant improvement in the ALT and AST levels in the Hijamat group versus control collection. Hijama could reduce oxidative stress by reducing iron reserves, which might enhance insulin sensitivity and perhaps result in a reduction in the generation of the liver glucose, in which is considered one of the causes for developing steatosis in Non-alcoholic fatty liver disease (13).

Table 2. Mean ALT, AST, ALP, GGT and BILI pre and post treatment of the group A and B:

	Pre treatment	Post treatment				
	Mean ± SD	Mean ± SD	MD	% of change	t- value	p value
ALT (IU/L)						
Group A	40.53 ± 7.37	32.3 ± 6.2	8.23	20.31	15.82	0.001
Group B	39.2 ± 6.54	36.43 ± 6.71	2.77	7.07	4.19	0.001
MD	1.33	-4.13				
t- value	0.74	-2.47				
	p = 0.46	p = 0.01				
AST (IU/L)						
Group A	35.06 ± 3.18	30.43 ± 2.99	4.63	13.21	8.18	0.001
Group B	34.8 ± 4.19	33 ± 4.33	1.8	5.17	2.78	0.001
MD	0.26	-2.57				
t- value	0.27	-2.67				
	p = 0.78	p = 0.01				
ALP (IU/L)						
Group A	156.13 ± 13.41	139.03 ± 14.25	17.1	10.95	11.37	0.001
Group B	158.06 ± 10.21	151.33 ± 10.23	6.73	4.26	5.75	0.001
MD	-1.93	-12.3				
t- value	-0.62	-3.83				
	p = 0.53	p = 0.001				
GGT (IU/L)						
Group A	36.9 ± 8.01	30.23 ± 6.78	6.67	18.08	13.48	0.001
Group B	36.26 ± 7.79	34.96 ± 7.73	1.3	3.59	10.93	0.001
MD	0.64	-4.73				
t- value	0.31	-2.53				
	p = 0.75	p = 0.01				
BILI (IU/L)						
Group A	0.85 ± 0.29	0.68 ± 0.19	0.17	20	6.48	0.001
Group B	0.87 ± 0.31	0.82 ± 0.29	0.05	5.75	5.66	0.001
MD	-0.02	-0.14				
t- value	-0.21	-2.16				
	p = 0.83	p = 0.03				

SD, standard deviation; MD, mean difference; p-value, probability value

Cupping does not improve liver enzymes, liver fats, or Insulin Resistance in participants with NAFLD. At six months, there were no remarkable variance between cupping and control collections in serum ALT level (14).

Wet cupping therapy could reduce the increased levels of AST and ALT in NAFLD patients, ALT levels in 13% of patients displayed a decrease of 30% post-therapy.

The P value in our complete ALT dataset showed no significant statistical variation; e.g., one patient

with an increased AST presented progress of 38% post-therapy. The P value in complete AST dataset showed no significant statistical variation considering these results. ALP remained almost constant after and before therapy in diseased persons within the normal range. In the normal range, cupping treatment could decrease GGT by 33% in 70% of diseased persons (15).

In the study by (16) after cupping. The results show a significant decrease in GGT, significant increase in ALP, in which lower levels of AST were observed in the cupping blood however, this decrease is not statistically significant.

The findings of this study in contrast with previous study (17) Wet cupping therapy has quite significant effect in raised liver function tests (Serum Bilirubin & SGOT, SGPT) respectively ($p < 0.0700$ & $p < 0.3683$).

Another study was carried out to assess the impact of hijamah on the liver, focusing on the impact on liver enzyme values (AST and ALT) and albumin protein values. This study found that following cupping, ALT plasma levels increased significantly, although AST levels did not differ significantly ($p\text{-value} = 0.527$) (mean \pm SD 15.265 \pm 13.0057 versus 16.057 \pm 12.0513). Additionally, there was no difference in the amount of albumin with a $p\text{-value}$ of 0.131. We can infer that blood cupping affects the ALT level but not the AST or albumin levels (18).

A Blood sample from the cupping displayed insignificant elevation in serum SGOT ($p < 0.001$) and reduction in serum SGPT ($p < 0.001$) levels (19).

Liver enzymes as ALT, AST and ALP are indicative of liver damage when found in larger than normal concentrations in the blood. These enzymes are lower after the Hijamah procedure and suggest a possibility of improved liver function and health after the Hijamah procedure (Islamic Cupping & Hijamah: A Complete Guide).

After two years of follow up, the patient group there was decrease in the values of Sgot, Sgpt, and GGT in iron-depletion patients than in control patients ($P < 0.05$). The occurrence with improvement in the absence of liver biopsy and the ALT decrease $\geq 20\%$ (associated with histological improvement in biopsied patients) was higher in the phlebotomy than in the control arm ($P = 0.022$). Iron deficiency had no effect on liver impairment improvement as measured by histology or a 20% reduction in ALT (20).

Cupping reduced insulin resistance and liver transaminase value in diseased persons with NAFLD. In addition, it improved their lipid profile. Cupping also significantly reduced the alanine aminotransferase and triglyceride values and elevated high-density lipoprotein value, too (21).

In patients with NAFLD and hyperserotonemia, phlebotomy did not improve the insulin level, ALT level, or AST level. There was mild improvement in alanine aminotransferase (ALT). Phlebotomy results in a mild but significant decrease in serum ALT with a very small effect size and no improvement in AST. Phlebotomy does not improve insulin resistance or liver enzymes (22).

6. Conclusion:

The current results demonstrated that, the wet cupping therapy is more successful in improving liver enzymes than a healthy, balanced diet in diseased persons with nonalcoholic fatty liver disease patients And for obese women, the wet cupping could give new perspectives in reducing and preventing the risk of CVDs at low cost.

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Conflict of Interests:

Authors declared no potential conflicts of interest.

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References:

- 1-Kasper, P., Martin, A., Lang, S., Kütting, F., Goeser, et al.,. NAFLD and cardiovascular diseases: A clinical review. *Clinical Research in Cardiology*. 2020. 1-17.
- 2-Ahmed M. Non-alcoholic fatty liver disease in. *World journal of hepatology*, 2015, 7(11), 1450–1459.
- 3- Kozlov, A. I. Carbohydrate-related nutritional and genetic risks of obesity for indigenous northerners. *Voprosy pitaniia*, (2019). 88(1), 5- 16.
- 4-Lee, S. W., Son, J. Y., Kim, J. M., Hwang, S. S., Han, J. S., & Heo, N. J. Body fat distribution is more predictive of all-cause mortality than overall adiposity. *Diabetes, obesity & metabolism*. 2018, 20(1), 141–147
- 5-Hegazy, M. A., Samy, M. A., Tawfik, A., Naguib, M. M., Ezzat, A., & Behiry, M. E. Abdominal subcutaneous fat thickness and homeostasis model assessment of insulin resistance as simple Opredictors of nonalcoholic steatohepatitis. *Diabetes, metabolic syndrome and obesity : targets and therapy*. 2019, 12, 1105–1111.
- 6-Petta, S., Gastaldelli, A., Rebelos, E., Bugianesi, E., Messa, P., Miele, L., Svegliati-Baroni, G., Valenti, L., & Bonino, F.. Pathophysiology of Non Alcoholic Fatty Liver Disease. *International journal of molecular sciences*. 2016, 17(12), 2082.

- 7- Shekarforoush, S., Foadoddini, M., Noroozadeh, A., Akbarinia, H., & Khoshbaten, A.: Cardiac effects of cupping: myocardial infarction, arrhythmias, heart rate and mean arterial blood pressure in the rat heart. *Chin J Physiol*, 55(4), 2012: 253-258
- 8-AL-Shamma, Y. M. Al-Hijamah cupping therapy. *Kufa Medica Journal*. 2009, 12(1), 49-56.
- 9-El Sayed, S. M., Mahmoud, H. S., & Nabo, M. M. H. Methods of wet cupping therapy (Al-Hijamah): in light of modern medicine and prophetic medicine. *Alternative & Integrative Medicine*. 2013, 1-16.
- 10-Khodadoostan M, Zamanidoost M, Shavakhi A, Sanei H, Shahbazi M, Ahmadian M. Effects of Phlebotomy on Liver Enzymes and Histology of Patients with Nonalcoholic Fatty Liver Disease. *Adv Biomed Res*. 2017, Feb 22;6:12
- 11-El Sayed, S. M., Al-quliti, A. S., Mahmoud, H. S., Baghdadi, H., Maria, R. A., Nabo, M. M. H., & Hefny, A. Therapeutic benefits of Al-hijamah: in light of modern medicine and prophetic medicine. *American Journal of Medical and Biological Research*. 2014, 2(2), 46-71.
- 12-Niasari, M., Kosari, F., & Ahmadi, A. The effect of wet cupping on serum lipid concentrations of clinically healthy young men: a randomized controlled trial. *The Journal of Alternative and Complementary Medicine*. 2007, 13(1), 79-82
- 13-Bashiri, H., Bozorgomid, A., & Shojaeimotlagh, V. Efficacy of Hijamat (wet cupping therapy) in Iranian patients with nonalcoholic fatty liver disease: a controlled clinical trial. *Turkish journal of medical sciences*, 2020, 50(2), 354–359.
- 14-Adams, L. A., Crawford, D. H., Stuart, K., House, M. J., St Pierre, T. G., Webb, M., Ching, H. L., Kava, J., Bynevelt, M., MacQuillan, G. C., Garas, G., Ayonrinde, O. T., Mori, T. A., Croft, K. D., Niu, X., Jeffrey, G. P., & Olynyk, J. K. The impact of phlebotomy in nonalcoholic fatty liver disease: A prospective, randomized, controlled trial. *Hepatology (Baltimore, Md.)*. 2015, 61(5), 1555–1564.
- 15-Nooshin.Abbasi, Mahdi Biglarkhani, Azam Meyari, Raziéh Amini, et al. Investigation of the effects of wet cupping therapy on some inflammatory factors in patients affected by non-alcoholic fatty liver disease (NAFLD): A quasi-experimental trial study with self-controls. 2022.
- 16-Shawaf, T., El-Deeb, W., Hussen, J., Hendi, M., & Al-Bulushi, S. Evaluation of wet cupping therapy on the arterial and venous blood parameters in healthy Arabian horses. *Veterinary world*. 2018, 11(5), 620–626.)
- 17-Shaikh Nikhat, Rafath Mehmooda, Shakir Jameel, Sufiyan Ahamad Ghawte and Masroor A. Qureshi. Efficacy of unani regimen- hijama maâ€™a shurt (wet cupping therapy) with oral unani formulation in the management of ziabetus shakri (type-ii diabetes mellitus)â€™ - A clinical study. 2013.
- 18-Mahdi, Mohamed Hamid Eldood. The Effect of Wet Blood Cupping on Alanine Aminotransferase Aspartate Aminotransferase and Albumin in Khartoum State\Mohamed Hamid Eldood Mahdi;Abdelgadir Elmugadam.-Khartoum:Sudan University of Science & Technology,Medical Laboratory Science. 2017, 57p.
- 19-Reza, Mohammad & Vaez Mahdavi, Mohammad Reza & Ghazanfari, Tooba & Aghajani, Marjan & Danyali, Farideh & Naseri, Mohsen. Evaluation of the Effects of Traditional Cupping on the Biochemical. 2012.
- 20-Valenti, L., Fracanzani, A. L., Dongiovanni, P., Rovida, S., Rametta, R., Fatta, E., Pulixi, E. A., Maggioni, M., & Fargion, S. A randomized trial of iron depletion in patients with nonalcoholic fatty liver disease and hyperferritinemia. *World journal of gastroenterology*. 2014, 20(11), 3002–3010.
- 21-Jaruvongvanich, V., Riangwiwat, T., Sanguankeo, A., & Upala, S. Outcome of cupping for treating nonalcoholic fatty liver disease: A systematic review and meta-analysis. *Saudi journal of gastroenterology : official journal of the Saudi Gastroenterology Association*. 2016, 22(6), 407–414.
- 22-Murali, A. R., Gupta, A., and Brown, K. Systematic review and meta-analysis to determine the impact of iron depletion in dysmetabolic iron overload syndrome and non-alcoholic fatty liver disease. *HepatolRes*.2018, 48: E30– E41.