

**Research Article**
**Open Access**

## The Effects of Thermal Dry Cupping Therapy in Type II Diabetes Mellitus in Omani Patients

Badriya Al-Rahbi<sup>1\*</sup>, Amal AW Sallam<sup>2</sup>, Najwa Al-Jahdami<sup>1</sup>, Hassan Sadek<sup>3</sup> and Azher Al-Habsi<sup>4</sup>

<sup>1</sup>Oman College of Health Sciences, Oman

<sup>2</sup>Department of Clinical and Chemical Pathology Research, Institute of Ophthalmology, Giza, Egypt

<sup>3</sup>Indian University, Lvy Tech College USA

<sup>4</sup>University College of Dublin, Ireland

### ABSTRACT

**Introduction:** Type 2 Diabetes Mellitus (T2DM) is a group of metabolic disorders characterized by insulin resistance. It's a multifactorial chronic disease and if not managed properly, it can lead to complications in both short-term and long-term incidences. These complications involve intensified blood cholesterol due to high incidence of blood glucose, which can lead to several complications. The gold standard treatment for T2DM is metformin, however other approaches have been studied in conjunction with the standard treatment, which can lead to improvement of cholesterol and blood sugar levels in diabetic patients in order to prevent further complications

**Method:** Thermal Dry Cupping Therapy was done using traditional glass cups on 30 T2DM patients, who have been diagnosed with diabetes for more than three years and are still using metformin. This method was repeated once a week for 4 weeks. Then fasting blood samples were obtained to measure the levels of blood glucose and lipid profile for total cholesterol levels, low density lipoprotein (LDL) and high density lipoprotein (HDL). Whereas the % of HAb1c was determined by ELISA method.

**Result:** Post cupping measurements showed a significant decrease in fasting blood glucose measurements of  $8.15 \pm 1.09$ , % HAb1c of  $45.71 \pm 5.89$ , and a significant decrease in total cholesterol levels of  $186.65 \pm 27.83$  and low density lipoprotein (LDL) of  $135.73 \pm 15.2$ , however an increase in high density lipoprotein (HDL) of  $45.71 \pm 5.89$  was observed.

**Conclusion:** The data suggest that several sessions of Thermal Dry Cupping therapy can decrease values of total cholesterol, low density lipoprotein, fasting blood glucose and percent of glycated haemoglobin. Hence, it might play a role in the improvement of impaired glucose metabolism, which can be beneficial as a complementary treatment for T2DM in Omani patients besides the standard treatment.

### \*Corresponding author

Dr. Badriya Al-Rahbi, Oman College of Health Sciences, Oman. E-mail: Drbadriya.bsc.ihc@gmail.com

**Received:** June 26, 2024; **Accepted:** July 03, 2024; **Published:** July 08, 2024

**Keywords:** Thermal Dry Cupping Therapy, Type 2 Diabetes Mellitus, Fasting Blood Glucose, Lipid Profile, Glycated Haemoglobin and Glucose Metabolism

### Literature Review

Type 2 Diabetes Mellitus (T2DM) is known as adult-onset diabetes and comprises approximately 90% of people with diabetes. T2DM usually includes a component of insulin resistance and over time results in  $\beta$ -cell failure. It is hard to target a single risk factor for T2DM as it is a combination of genetics, environment, and poor lifestyle, which lead to insulin resistance, obesity, and other diabetes related complications. These complications include; macrovascular disease, neuropathy, nephropathy and retinopathy. T2DM can be managed by alterations in lifestyle and diet, but over time the majority of people progress to needing oral and injectable diabetes therapies.

Since early times, complementary and alternative medicine have played an important role in human health and welfare. Many therapeutic approaches in healthcare outside the margins of conventional medicine persist in various parts of the world [1].

Thermal dry cupping therapy (TDCT) is a traditional healing technique that has been employed in various cultures for centuries. It involves the use of heated cups placed on the skin to create a vacuum, which in turn, draws the skin and underlying tissues into the cup. The therapy is believed to offer a wide range of benefits, both physical and psychological. This literature review explores the benefits of heat cupping therapy, citing relevant research to support each claim. One of the most commonly reported benefits of heat cupping therapy is pain relief. Research by. found that heat cupping therapy was effective in reducing musculoskeletal pain, including lower back pain and neck pain. The application

of heat helps to relax muscles and increase blood flow, which can alleviate discomfort and promote healing [2,3].

TDCT has been shown to enhance blood circulation. A study conducted by demonstrated that cupping therapy increased microcirculation in the treated areas. Improved blood flow can aid in the delivery of oxygen and nutrients to tissues, which is essential for healing and recovery [4].

Cupping therapy, including heat cupping, is known to have a relaxing effect on the body. It can help reduce stress and anxiety levels. Reported that cupping therapy induced a calming effect and reduced the participants' perception of stress. Some supporters of heat cupping therapy suggest that it helps the body detoxify by drawing out toxins through the skin. While more research is needed in this area, a study by did find that cupping therapy resulted in increased excretion of certain waste products through urine. Therefore, we hypothesis that TDCT in conjunction with T2DM treatment can improve fasting blood glucose levels, % of Glycated Haemoglobin, and lipid profile in T2DM patients [5,7].

## Subjects

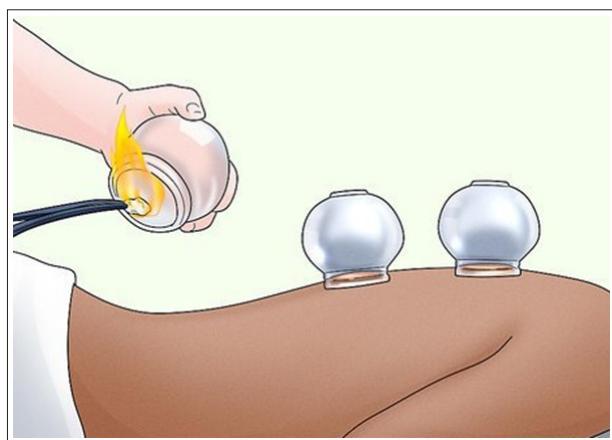
Subjects: 30 subjects were enrolled in the study. Twenty Omani Type 2 diabetic patients on (all were male subjects, mean age  $56.11 \pm 1.48$  years). Informed consent was obtained for all study participants. All diabetic patients were previously diagnosed cases and are on metformin drug; the mean duration of T2DM for more than 3 years. It was recommended that patient should not eat at least 2-4 hours before cupping.

## Methods

### Methods of Cupping

Traditional glass of cups made were used on 30 diabetic Omani patients and was repeated twice a week for a period of 4 months. The Glass cups used in this study are heated with an open flame (Figure 1). Soaked cotton ball or a candle was used as a heat source in the study.

Massage oil or lotion was used to lubricate the skin and create a seal for the cups to adhere to. A Cotton balls or a small towel was used for extinguishing the flame and creating a vacuum inside the glass cups.



**Figure 1:** Traditional Thermal Cupping Therapy

### Random Fasting Blood Glucose

Measurements were taken daily by obtaining a blood sample from the fasting patients over night or for at least 8 hours then using the glucometer to determine the values of blood sugar, each measurement was repeated thrice for accuracy.

### 3.3%HbA1c

The levels of HbA1c were determined by ELISA method. Samples were centrifuged for 15 minutes. Sample were removed and assay was performed immediately by using a human HbA1c kit. 50  $\mu$ L of each standard, control and sample were added into a 96 well pre coated microplate. Then 50  $\mu$ L of Detection Reagent A was added to each well, sealed then incubated for 1 hr at 37 °C. Plate was washed 3X with 1X wash buffer. Then 100  $\mu$ L of Detection Reagent B was added into each well, sealed and incubated at 37°C for 30 min. Washing was repeated as previously but for 5X. 90  $\mu$ L of TMB Substrate was added to each well, sealed then incubated at 37°C for 10-20 min, avoiding exposure to light. 50  $\mu$ L of stop solution was added to each well then the plate was read at 450 nm immediately. There is an inverse correlation between HbA1c concentration in the sample and the absorbance measured, the HbA1c concentration of the samples were interpolated from the standard curve.

### Lipid Profile

Patients were asked to fast overnight or for at least eight hours, a blood sample was drawn for a fasting lipid profile. The test provides a measurement of the serum concentrations of total cholesterol, triglyceride, HDL-C, and calculated LDL-C. Standard lipid analysis includes measurements of serum or plasma total cholesterol, triglycerides, and high density lipoprotein cholesterol (HDL-C) after an overnight fast. Low density lipoprotein cholesterol (LDL-C) is then calculated using Friedewald formula.

### Data Handling and Statistical Methods

The statistical software package (SPSS version 20.0) was used for data management and analysis. The data were subjected to the Kolmogorov- Smirnov test to determine the distribution and method of analysis. As most of the data was normally distributed continuous variables student's t test was used. The data were analyzed by one-way ANOVA and Pearson correlation coefficient. All the results are expressed as mean  $\pm$  standard error of the mean (SEM), and with the level of significance set at  $P < 0.05$ .

## Results

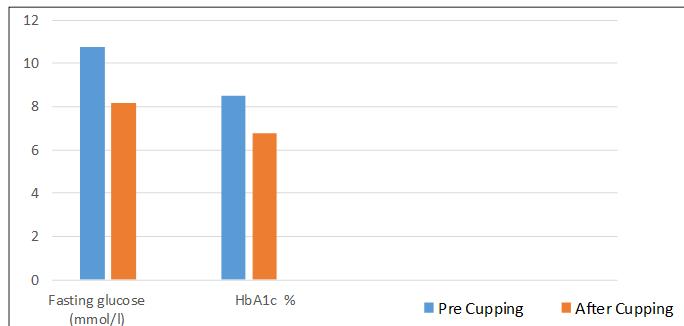
Characteristics of subjects investigated are present in Table 1. The mean and  $\pm$  SD values of the age for the diabetic male subjects mean age  $56.11 \pm 1.48$  years

**Table 1: Characteristics of the Studied Subjects**

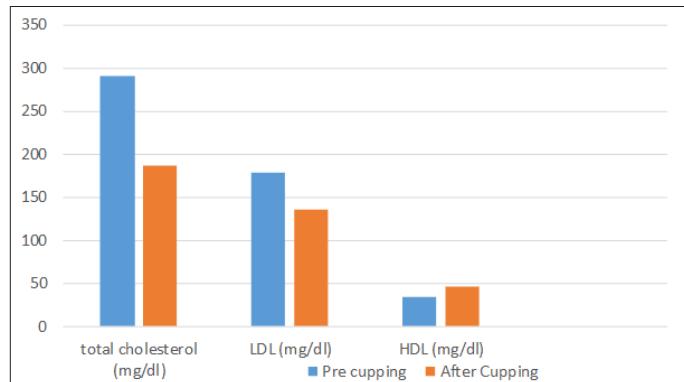
Characteristics of Subjects	Subjects with diabetes
Gender	
Male	30
Age (years)	$56.11 \pm 1.48$

Table 2 demonstrates mean and  $\pm$  SD values of fasting blood glucose (FBG) and HbA1c, total cholesterol, low density lipoprotein (LDL) and high density lipoprotein (HDL), of investigated subjects. Fasting blood glucose (FBG) levels were  $(10.75 \pm 1.31 \text{ mmol/L})$  in the pre cupping diabetic patients compared post cupping treatments the levels were  $(8.15 \pm 1.09 \text{ mmol/L})$ . The data showed that there is a significant decrease in fasting blood glucose ( $p < 0.05$ ).

Graph 1 demonstrates fasting blood glucose levels and Glycated haemoglobin (HbA1c) % pre and post cupping. HbA1c levels were  $(8.5 \pm 0.46\%)$  in the pre-cupping diabetic patients compared to the HbA1c levels of post-cupping  $(6.8 \pm 0.35\%)$ . The data showed that there is a significant decrease in HbA1c % of the subjects ( $p < 0.05$ ).



**Graph 1:** Demonstrates Fasting blood glucose Levels and Glycated Haemoglobin (HbA1c%) before and After Cupping



**Graph 2:** Showing Total Cholesterol Levels, LDL And HDL Before and After Cupping

## Discussion

The review of literature has shown the increased interest in ascertaining the relationship between diabetes mellitus and cupping heat therapy in different medical conditions. Constantly increasing research tries to discover the exact role of cupping heat therapy in improvement of glucose metabolism.

In our study our results showed a decrease in the levels of fasting blood glucose (FBG)  $(10.75 \pm 1.31 \text{ mmol/L})$  in the subjects pre cupping compared to post cupping treatments the levels were  $(8.15 \pm 1.09 \text{ mmol/L})$ . The data showed that there is significant decrease in fasting blood glucose ( $p < 0.05$ ). Also, HbA1c levels were  $(8.5 \pm 0.46\%)$  in the subjects pre-cupping compared to the HbA1c levels post-cupping  $(6.8 \pm 0.35\%)$ . The data showed that there is significant decrease in HbA1c % of the subjects ( $p < 0.05$ ). These results indicated that there was a positive correlation between cupping heat therapy and glucose metabolism disorder.

These results were in agreement with a study by investigated the immediate effects of heat cupping on blood glucose levels in a small group of individuals with type 2 diabetes. The researchers found a statistically significant decrease in blood glucose levels immediately after a single session of heat cupping therapy. This reduction in glucose levels was attributed to improved circulation and enhanced insulin sensitivity [8].

Claimed that the effect of cupping might be due to stimulating

blood circulation and supplying nutrients to beta cells in the pancreas. In addition to controlling insulin production levels [9].

Lipid profile values were detected in blood samples of the subjects which included total cholesterol, LDL and HDL pre cupping and post cupping therapy. The total cholesterol levels pre cupping were  $290.99 \pm 19.88 \text{ mg/dl}$ . Post cupping the total cholesterol levels decreased to  $186.65 \pm 27.83 \text{ mg/dl}$ . The data showed that there is significant decrease in fasting glucose ( $p < 0.05$ ).

Results of low density lipoprotein (LDL)  $179.26 \pm 23.2 \text{ mg/dl}$  pre cupping and  $135.73 \pm 15.2 \text{ mg/dl}$  post cupping. The data showed that there is significant decrease in LDL of the subjects ( $p < 0.05$ ).

Results of High-density lipoprotein (HDL)  $34.41 \pm 3.8 \text{ mg/dl}$  precupping and  $45.71 \pm 5.89 \text{ mg/dl}$  post cupping. The data showed that there is significant increase in HDL of the subjects ( $p < 0.05$ ). Impaired glucose metabolism can cause changes in the lipid profile,  $\beta$  cell dysfunction and insulin resistance can be induced by elevated levels of triglycerides, which lead to elevated levels of free fatty acids. The exact mechanism is partially understood, where disruption of the cascade linking insulin receptors with glucose transporter can be caused by elevated free fatty acids. Dyslipidemia which is characterized by elevated triglycerides, low HDL-C and the predominance of small-dense LDL particles is seen in 60-70% of type 2 diabetes patients. An increased catabolism of HDL and a shift to LDL can be as a result of increased levels of triglycerides in the blood leading to hypertriglyceridemia. Additionally, inflammation can be modulated by free fatty acids, so hypertriglyceridemia can cause inflammation which leads to insulin resistance and  $\beta$  cell dysfunction, therefore improvements in blood glucose levels can improve lipid profile levels [10-14]. A Study have shown that HDL may directly affect glucose metabolism, as less hyperglycaemia was associated with higher concentrations of HDL. This is achieved by the anti-inflammatory properties of HDL and alteration of lipid environment by induction of reverse cholesterol transport. Additionally, many studies have shown that the goal is to decrease LDL levels to  $<100 \text{ mg/dL}$  in diabetic patients, if statins therapy can't achieve this then combination therapy is recommended [15-18].

These findings of this study agreed with results of, who recommended cupping as a prophylactic and/or complementary treatment for hyperglycaemia and hyperlipidaemia and confirmed the short-term health benefits of cupping therapy [19-24].

## Conclusions

In conclusion, while there is some preliminary evidence to suggest that heat cupping therapy may have a positive impact on fasting blood glucose levels and subsequent effects of diabetes mellitus on the lipid profile. Further research is needed to confirm these findings and understand the underlying mechanisms. Heat cupping therapy should not replace standard pharmacological diabetes mellitus treatment but maybe prophylactic and/or complementary to diabetes treatment.

## References

1. Hapipah P, Zulhan MI, Nadrati B (2022) Cupping Therapy to Reduce Total Cholesterol Levels in People with Diabetes. Journal of Health Science 15: 46-51.
2. Cao H, Han M, Li X, Dong S, Shang Y, et al. (2018) Clinical research evidence of cupping therapy in China: a systematic literature review. BMC Complementary and Alternative Medicine 18: 1-15.

3. Huang CY, Choong MY, Li TS, Yu YJ, Wu HY, et al. (2020) Cupping therapy for improving blood circulation antioxidant activity, and inflammatory response in hypertensive athletes. *Complementary Therapies in Medicine* 50: 102372.
4. Choi JY, Lee JH, Kim YH, Yoon JY, Kim KH (2019) Microcirculatory effect of negative pressure cupping therapy is like that of heat therapy. *BioMed Research International*.
5. AlBedah AMN, Elsubai IS, Qureshi NA, Aboushanab TS, Ali GI, et al. (2015) the medical perspective of cupping therapy effects and mechanisms of action. *Journal of Traditional and Complementary Medicine* 5: 12-15.
6. Kim S, Lee SH, Kim MR, Kim JH, Jeon JH, et al. (2019) Effects of cupping therapy on body composition, blood pressure and oxidative stress in adults with obesity. *The Journal of Alternative and Complementary Medicine* 25: 942-950.
7. Li W, Zhou Q, Sun Y, Gao L (2018) immediate effect of cupping therapy on blood glucose levels in patients with non-insulin-dependent diabetes mellitus. *Journal of Traditional Chinese Medicine* 38: 391-395.
8. Inggarsih R (2021) Cupping Therapy Benefit in Glucose Blood level. *Arkus* 7: 169-175.
9. Briaud I, Harmon JS, Kelpe CL, Segu VB, Poitout V (2001) Lipotoxicity of the pancreatic beta-cell is associated with glucose-dependent esterification of fatty acids into neutral lipids. *Diabetes* 50: 15-321.
10. Racheck L (2014) free fatty acids and skeletal muscle insulin resistance. *Prog Mol Biol Transl Sci* 121: 267-292.
11. Wu L, Parhofer KG (2014) Diabetic dyslipidemia. *Metabolism* 63: 1469-1479.
12. Adiels M, Olofsson SO, Taskinen MR, Boren J (2008) Overproduction of very low-density lipoproteins is the hallmark of the dyslipidemia in the metabolic syndrome. *Arterioscler Thromb Vasc Biol* 28: 1225-1236.
13. Avramoglu RK, Basciano H, Adeli K (2006) Lipid and lipoprotein dysregulation in insulin resistant states. *Clin Chim Acta* 368: 1-19.
14. Cannon CP, Blazing MA, Giugliano RP, McCagg A, White JA, et al. (2015) Ezetimibe added to statin therapy after acute coronary syndromes. *N Engl J Med* 372: 2387-2397.
15. Catapano AL, Reiner Z, De Backer G, Graham I, Taskinen MR, et al. (2011) Guidelines for the management of dyslipidaemias The Task Force for the management of dyslipidaemias of the European Society of Cardiology (ESC) and the European Atherosclerosis Society (EAS). *Atherosclerosis* 217: 3-46.
16. WEIR GC, Cavelti-Weder C, Bonner-Weir S (2011) Stem cell approaches for diabetes: towards beta cell replacement. *Genome medicine* 3: 61.
17. Jun M, Foote C, Lv J, Neal B, Pate IA, et al. (2010) Effects of fibrates on cardiovascular outcomes: a systematic review and meta-analysis. *Lancet* 375: 1875-1884.
18. Rahman H, Ahmad G, Mustapha B, Al-Rawi H, Hussein R, et al. (2020) Wet cupping therapy ameliorates pain in patients with hyperlipidaemia hypertension, and diabetes: A controlled clinical study. *International Journal of Surgery Open* 26: 10-15.
19. Chaudhury A, Duvoor C, Dendi R, Sena V, Kraleti S, et al. (2017) Clinical review of antidiabetic drugs: Implications for type 2 diabetes mellitus management. *Frontiers in Endocrinology* 8: 6.
20. Chen B, Li MY, Liu PD, Guo Y, Chen ZL (2017) Clinical study on treatment of knee osteoarthritis with moving cupping therapy based on the theory of pain due to stagnation of blood flow. *World Journal of Acupuncture-Moxibustion* 27: 16-20.
21. Gao L, Wang K, Xie XH, Wang LL, Zhang R, et al. (2018) Clinical research on treatment of bronchial asthma with acupuncture and cupping therapy. *Journal of Acupuncture and Tuina Science* 16: 378-381.
22. Lauche R, Cramer H, Choi KE, Rampp T, Saha FJ, et al. (2018) The influence of a series of five dry cupping treatments on pain and mechanical thresholds in patients with chronic non-specific neck pain—A randomised controlled pilot study. *BMC Complementary and Alternative Medicine* 18: 1-11.
23. Yousefi F, Ardakani M, Mombeini M (2020) Effect of wet cupping therapy on acne vulgaris: a randomized controlled trial. *Journal of Traditional and Complementary Medicine* 10: 479-485.
24. Wang Y, Zhao L, Zhang H (2019) Effect of cupping therapy on glycemic control in patients with type 2 diabetes: A randomized controlled trial. *Journal of Traditional Chinese Medicine* 39: 549-553.

**Copyright:** ©2024 Badriya Al-Rahbi, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.