

## Effect of Cupping Therapy on Blood Glucose Level in Type II Diabetic Women

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### Abstract

**Background:** Diabetes mellitus is a group of metabolic disorders in which there are high blood glucose levels over a prolonged period. Diabetes can cause many complications. Acute complications can include diabetic ketoacidosis, hyperosmolar hyperglycemic state, Chronic complications include cardiovascular disease, stroke, chronic kidney disease, foot ulcers, and damage to the eyes.

**Aim of Study:** To study the effect of cupping therapy on blood glucose level in type II diabetic women.

**Material and Methods:** Sixty type 2 diabetic patients were selected from out-patient clinic of Internal Medicine Department of Zagazig General Hospital. The practical work was done in the duration between July 2019 till February 2020.

They were diagnosed with specialized physician as T2DM patients for more than 5 years, their age ranged from (55-65 years) and they were randomly assigned into two groups (A&B) equal in number. Each group consisted of thirty patients. Parameters measured from both groups were HbA1c and Pain. Group (A) performed aerobic training in the form of walking on treadmill with intensity ranged from 60-70% of HRmax only for three sessions every week for 3 months while group (B) performed aerobic exercise and cupping therapy once a month for three months. Both groups were under medical treatment.

**Results:** There was a significance decrease in HbA1c and pain in group B compared with group A post treatment. The percent of improvement of HbA1c and pain for group (B) was 14.76%, 45.05% and for group (A) was 10.36%, 37.88%, respectively. The significance decrease in the mean values post treatment ( $p=0.01$ ), ( $0.01$ ).

**Conclusion:** Using cupping therapy combined with aerobic exercise is superior to aerobic exercises only regarding blood glucose level in type 2 diabetic women.

**Key Words:** Diabetes – Aerobic exercise – Cupping therapy.

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### Introduction

**DIABETES** mellitus, or simply diabetes, is a group of metabolic diseases in which a person has high blood sugar either because the pancreas does not produce enough insulin, or because cells do not respond to the insulin that is produced [1].

DM begins with insulin resistance, a condition in which cells do not react properly to insulin. As the illness progresses, a shortage of insulin may occur. "Non Insulin Dependent DM Mellitus" (NID-DM) or "adult-onset DM" were the terms used before to describe this disease. The most common cause is a combination of over weight and lack of activity [2].

Cupping therapy is an ancient medical treatment that has been used for health promotion, preventive, and therapeutic purposes. Cupping therapy has reported benefits in the treatment of localized diseases (neck pain, lower back pain, and knee pain) and systematic diseases (diabetes mellitus, hypertension, and rheumatoid arthritis) [3].

During cupping suction, mechanical stress (due to subatmospheric pressure) and local anaerobic metabolism (partial deprivation of O<sub>2</sub>) might create physiological and mechanical signals that could activate or inhibit gene expression, according to the genetic hypothesis. Surface scarifications might trigger the wound healing mechanism and gene expression program in wet cupping treatment [4].

Aerobic exercise (also known as cardio) is physical exercise training for improving metabolic dysregulation (diabetic risk factors) and, in parallel, may directly promote nerve regeneration and function [5].

Aerobic training increases mitochondrial density, insulin sensitivity, oxidative enzymes, compliance and reactivity of blood vessels, lung function, immune function, and cardiac output. Moderate to high volumes of aerobic activity are associated with substantially lower cardiovascular and overall mortality risks in both type 1 and type 2 diabetes. In type 1 diabetes, aerobic training increases cardiorespiratory fitness, decreases insulin resistance, and improves lipid levels and endothelial function. In individuals with type 2 diabetes, regular training reduces A1C, triglycerides, blood pressure, and insulin resistance [6].

### Material and Methods

**Inclusion criteria:** Current study was conducted to evaluate the effect of cupping therapy on blood glucose level in type II diabetic women. Sixty type 2 diabetic patients were selected from out-patient Clinic of Internal Medicine Department of Zagazig General Hospital. The practical work was done in the duration between July 2019 till February 2020. They were diagnosed with specialized physician as T2DM patients for more than 5 years, their age ranged from (55-65 years) and they were randomly assigned into two groups equal in number (study group and control group). The study group consist of 30 patients who underwent cupping therapy one time a month for 3 months and aerobic exercises in the form of walking on treadmill with intensity of 60-70% of HRmax for three sessions every week for 3 months. The control group underwent aerobic exercise program only. Both groups were on medical treatment.

**Exclusion criteria:** The following patients were excluded from the study patients with contra indication to cupping therapy: Patient suffer from hepatic diseases, Anemia, Hypotension, Heart diseases, pregnancy. And Patients with contra indication to aerobic exercise, (patient suffer from myocardial infarction, unstable angina).

**Evaluation procedures:** Patients were evaluated for BMI ( $\geq 30 \text{ kg/m}^2$ ), HbA1c ( $\geq 6.5\%$ ) and VAS. Measuring weigh and height to calculate BMI by using.

$$\text{BMI} = \text{Weigh kg/height m}^2$$

These parameters measured pre and post treatment after 3 months.

#### Treatment procedure:

##### 1- Aerobic exercise program:

Participants in both groups underwent aerobic exercise program in the form of walking on tread-

mill with intensity ranged from 60-75% of HRmax. calculated from this equation:  $\text{HRmax} = 208 - 0.7 \text{ age}$ . The session was started by the following: Warming up phase: 5 minutes in the form of breathing exercises and stretching exercises. Training phase: 20 minutes waking on treadmill, cooling down phase 5 minutes the same as warming up phase. So the total of sessions was 30 minutes.

##### 2- Cupping therapy:

Participants in study group only underwent cupping therapy one session a month for 3 months.

These points were used in the 3 sessions of the cupping therapy for 3 months.

- Point 1: Is the seventh vertebra of the neck (bone of spine).
- Point 22&23: Is above the pancreas gland under the rib end.
- Point Lu5: Is on the transverse cubital crease, on the radial side of the tendon of the muscle biceps brachii.
- Point Yanglingquan GB34: Is in the depression anterior and distal to the head of fibula.

#### Statistical analysis:

Descriptive statistics and unpaired *t*-test were conducted for comparison of subject characteristics between both groups. Normal distribution of data was checked using the Shapiro-Wilk test. Levene's test for homogeneity of variances was conducted to ensure the homogeneity between group. Unpaired *t*-test was conducted to compare the mean values of VAS, HbA1c. Paired *t*-test was conducted for comparison between pre and post treatment in each group. The level of significance for all statistical tests was set at  $p < 0.05$ . All statistical analysis was conducted through the statistical package for social studies (SPSS) version 25 for windows (IBM SPSS, Chicago, IL, USA).

### Results

#### Subject characteristics:

Table (1) showed the subject characteristics of the study and control group. There was no significant difference between both groups in the mean age and BMI ( $p > 0.05$ ).

Table (1): Comparison of subject characteristics between study and control groups.

	Mean $\pm$ SD		<i>p</i> -value
	Study group	Control group	
Age (years)	58.2 $\pm$ 2.18	57.8 $\pm$ 1.93	0.45
BMI (kg/m <sup>2</sup> )	30.85 $\pm$ 1.68	31.66 $\pm$ 3.34	0.24

SD: Standard deviation. *p*-value: Probability value.

**Effect of treatment on VAS, HbA1c:****- Within group comparison:**

There was a significant decrease in VAS and HbA1c in the study and control groups post treatment compared with that pre treatment ( $p>0.001$ ). The percent of change of VAS and HbA1c in study group was 48.05 and 14.76% respectively and that in control group was 37.88 and 10.36% respectively.

**- Between groups comparison:**

There was no significant difference in all variables between groups pre-treatment ( $p>0.05$ ). Comparison between groups post treatment revealed a significant decrease in VAS and HbA1c of the study group compared with that  $>0.001$ .

Table (2): Mean VAS and HbA1c pre and post treatment of the study and control groups.

	Pre Mean±SD	Post Mean±SD	MD	% of change	t- value	p- value
<b>VAS:</b>						
- Study group	6.16±1.39	3.2±1.42	2.96	48.05	18.25	0.001
- Control group	6.6±0.96	4.1±1.34	2.5	37.88	16.69	0.001
- MD	-0.44	-0.9				
- t-value	-1.4	-2.51				
	$p=0.16$	$p=0.01$				
<b>HbA1c (%):</b>						
- Study group	8.13±0.46	6.93±0.34	1.2	14.76	19.87	0.001
- Control group	8.01±0.57	7.18±0.39	0.83	10.36	12.25	0.001
- MD	0.12	-0.25				
- t-value	0.91	-2.63				
	$p=0.36$	$p=0.01$				

SD : Standard deviation.

MD: Mean difference.

p-value: Probability value.

**Discussion**

This study was conducted to determine the effect of cupping therapy on blood glucose level type II diabetic women.

In this study the percent of improvement of HbA1c for group (A) was 30.13%, for group (B) was 18.97%. The percent of improvement of Pain for group (A) was 14.08%, for group (B) was 13.03%.

The results of this study coincided with the results achieved by Kamal et al., [7] found that Using cupping therapy combined with aerobic exercise is superior to aerobic exercises only regarding glycemic control in type 2 diabetic patients. The percent of improvement of HbA1c, fasting blood glucose, post prandial plasma glucose for group (A) (cupping therapy combined with aerobic exercise) was 30.13%, 14.08%, and 23.62% and for group (B) (aerobic exercise only) was 18.97%, 13.03%, and 16.26% respectively. The significance

decrease in the Effect of Cupping Therapy on Glycemic Control in Type II Diabetic Patients.

The results of this study coincided with the results achieved by Huijuan and Jisping [8] in a systematic review of randomized clinical trials suggested a potential positive short-term effect of cupping therapy on reducing pain intensity compared with no treatment, heat therapy, usual care, or conventional drugs concluded that Cupping combined with acupuncture was superior to acupuncture alone on post-treatment pain intensity (VAS, MD -1.18cm, 95% CI -1.68 to -0.68).

The results of this study coincided with the results achieved by Shirin et al., [9] When compared to the control group, the test group (regular physiotherapy with cupping) showed a substantial reduction in symptom severity ( $p=0.006$ ), and a significant decrease in distal sensory delay ( $p=0.007$ ).

The results of this study coincided with the results achieved by Farhad et al., [10] discovered that HbA1c reduced more in the exercise group than in the control group ( $p=0.014$ ).

**Conclusion:**

It was concluded that patients in cupping therapy with aerobic exercise reduce the glycated hemoglobin and pain in type II diabetes mellitus patients more than aerobic exercise only.

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## تأثير الحجامة على مستوى السكر في الدم في مريضات النوع الثاني من السكر

- شارك في هذه الدراسة ستون مريضة. تم تقسيمها عشوائياً إلى مجموعتين متساويتين في العدد (٣٠ مريضة في كل مجموعة).
- تلقت المجموعة الأولى الحجامة مرة شهرياً لمدة ثلاث شهور بجانب التمرينات الهوائية ثلاث مرات أسبوعياً لمدة ثلاث شهور والمجموعة الثانية تلقت التمرينات الهوائية فقط ثلاث مرات أسبوعياً لمدة ثلاث شهور.
- وقد تم قياس الهيموجلوبين السكري وقياس شدة الألم قبل وبعد انتهاء الدراسة التي استمرت ثلاث شهور.
- وكانت النتائج كالتالي:
- أظهرت هذه الدراسة إنخفاض ذو دلالة إحصائية في الهيموجلوبين السكري وإنخفاض الألم لكن كان متفوقاً أكثر في المجموعة الأولى.
  - وأخيراً توضح النتائج أن الحجامة والتمرينات الهوائية أدى إلى تحسن ملحوظ في مستوى السكر في الدم والشعور بالألم لدى مرضى السكري من النوع الثاني.
  - توصى الدراسة باستخدام الحجامة والتمرينات الهوائية ضمن البر نامج العلاجي لمرضى السكري (النوع الثاني).
  - إجراء المزيد من الأبحاث حول استجابة سكر الدم للعلاج بالحجامة باستخدام عينات أكبر ولفترات أطول ومقارنة ذلك في كلا الجنسين
  - توصى الرسالة باتباع الارشادات السليمة عند استخدام الحجامة حتى نتجنب الاستخدام العشوائي لها.
  - توصى الرسالة بعدم قيام غير المتخصصين في هذا المجال باستخدام هذه الوسائل حتى نتجنب الآثار الجانبية السلبية لها.