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Original Article

The Effects of Wet Cupping (Al-Hijamah) on Diabetic Sudanese Patients

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Abstract

Background: Wet cupping therapy (Al-hijamah) is a traditional medical practice that has long been used to manage metabolic disorders. This study explores its potential as a complementary therapy for managing diabetes in Sudanese patients by assessing its effects on blood glucose and HbA1c levels.

Method: A prospective, interventional case-control study was conducted at two cupping centers in Khartoum State, Sudan. The study included 58 participants; 42 diabetic patients and 16 healthy controls. A total of 174 blood samples were collected at three time points: before treatment, from the cupping site, and one week after treatment. Standard biochemical methods were used for analysis. The level of changes in the biochemical parameters was measured by the purification index (PI).

Results: Post-treatment analysis revealed a decrease in mean blood glucose level among diabetic patients from 158.9 mg/dl to 149 mg/dl, corresponding to a 6.2% percentage improvement (PI). Similarly, the healthy control group exhibited a reduction from 141 mg/dl to 127.4 mg/dl (PI = 9.7%). HbA1c levels also declined in both groups, from 6.5% to 6.2% in

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diabetic patients and from 6.0% to 5.6%, in healthy controls, reflecting improved glycemic control in both groups. Notably, diabetic patients with concurrent hypertension demonstrated a marked decrease in glucose levels from 303 mg/dl to 183 mg/dl (PI = 39.6%), alongside a substantial reduction in HbA1c from 8% to 5.9%. **Conclusion**: These findings indicate that Al-hijamah (wet cupping therapy) may contribute to modest - yet clinically meaningful improvements in glycemic regulation, particularly among patients with poorly controlled diabetes or comorbid conditions. However, larger-scale – studies with extended follow-up periods are warranted to confirm these outcomes and assess the long- term safety and efficacy of this complementary therapy.

Keywords: Al-hijamah, wet cupping blood glucose, diabetes, HbA1c, Sudanese.

Introduction

Al-hijamah (wet cupping) is a centuries-old therapeutic method rooted in traditional Islamic medicine and continues to be widely practiced across Africa, Asia, and the Middle East. Historically, it has been used across cultures to treat a wide range of ailments, often guided by humoral theories and traditional healing systems. Despite its widespread use, the underlying scientific mechanisms of Al-hijamah remain poorly understood. While the practice has recently gained renewed interest, particularly in managing chronic conditions, its integration into modern medicine has been limited due to a lack of robust scientific evidence and standardized protocols. This gap in mechanistic understanding continues to hinder its acceptance in evidence-based clinical settings [1,2].

In recent years, however, there has been renewed interest in cupping, leading to an increase in scientific investigations aimed at elucidating the physiological mechanisms behind its therapeutic effects [3]. Additionally, the evolution of cup design and technique has paralleled advancements in its clinical applications across different healthcare traditions [4].

Traditionally employed to "draw out" toxins and restore internal balance, Al-hijamah has gained attention as a complementary approach for chronic conditions such as type 2 diabetes. While its mechanisms are not fully understood, proposed effects include improved microcirculation, immune modulation, and enhanced removal of metabolic waste through superficial skin incisions. Notably, blood drawn during Al-hijamah has been found to contain elevated levels of harmful substances such as excess iron, cholesterol, and uric acid, distinguishing it from conventional phlebotomy [5,6].

Globally, an estimated 20–25% of adults are affected by metabolic syndrome, significantly increasing the risk of cardiovascular disease and type 2 diabetes [7]. In Sudan, the prevalence of diabetes among adults aged 20–79 years is currently estimated at 19%, with projections rising to 21.1% by 2050 [8]. A study conducted in Sudan reported that 27% of patients with type 2 diabetes also met the criteria for metabolic syndrome, especially among urban populations [9]. Key contributing factors include obesity, physical inactivity, and high dietary sugar intake, which are increasingly prevalent in eastern regions of Sudan [10].

As cupping therapy regains global popularity, it is critical to conduct rigorous scientific research to validate its therapeutic claims and elucidate its underlying mechanisms. Despite its historical use in Sudanese communities, there remains a lack of empirical research assessing the relationship between Al-hijamah and metabolic disorders such as diabetes and hypertension. This gap highlights the need for locally grounded studies to support evidence-based practice and inform public health policy. In light of growing interest in integrating traditional therapies into modern healthcare, this study explores the impact of Al-hijamah on glycemic control in Sudanese patients with type 2 diabetes, contributing to the limited but expanding body of scientific evidence.

Methodology:

Study Design: This study is designed as a prospective interventional case and control (comparative) health facilities-based study.
Study Area: The study was conducted in two Hijamah (cupping) centers situated in Khartoum State, Sudan. The first center, Aleinaaia Hijamah Center, is located in Omdurman city, The second center, Haja Asma Hijama Center, is situated in Algerif in Khartoum city.

Study Population: The target population for this study comprises Sudanese patients diagnosed with diabetes mellitus who sought treatment at the cupping centers. These patients were compared with a control group consisting of apparently healthy individuals including both males and females attending the clinic for cupping therapy (Alhijamaha) to seek relief from various health conditions during the study period. An interview and investigation were conducted, and a total of 174 samples were collected from 58 volunteers to contribute to the study's findings.

Inclusion Criteria: This study encompassed the following categories of individuals: Diabetic Patients i.e. individuals diagnosed with diabetes mellitus, managed through hypoglycemic medications or those controlling their condition through diet and conservative treatments were eligible for inclusion. Patients with both hypertension and diabetes was identified as sub group. The presence of co-morbid conditions was taken into account to assess potential differences in outcomes or treatment responses."

Control group of apparently healthy individuals who voluntarily opted for Al-Hijamah therapy to enhance their general health. Similar investigations were conducted on the control groups to parallel the assessments carried out on the diabetic patients.

The instrument for data collection was a pretested questionnaire consisting of three sections. The first section included the demographic information. Section two consisted of the information about diabetes history, and section three the biochemical markers of investigation which will be carried. Three samples were taken from each participant. The first sample was taken from venous blood before Al-hijamah as the baseline, then the second sample was taken from the cup and a third one was one week after Al-hijamah. The level of the biochemical parameters was measured by purification index (PI) using the formula: PI=100×([initial concentration of any substance in serum before Al-hijamah minus concentration of the same substance in serum after Al-hijamah] over initial concentration of same substance in serum before Al-hijamah).

For the assessment of diabetic patients and their controls, the study employed specific methods and procedures for measuring glucose and hemoglobin A1c levels.

Glucose Measurement: Glucose levels were measured using the glucose oxidase/peroxidase method from Bio system (Spain). This method allows for the accurate determination of glucose concentrations in the samples.

Hemoglobin A1c Measurement: Hemoglobin A1c levels were quantitatively determined using the CERA-STAT HbA1c test kit. This kit is designed for the precise measurement of glycated hemoglobin in the sample, providing insights into long-term glucose control.

Statistical Analysis: The collected data was statistically analyzed using the Statistical Package for the Social Sciences (SPSS) version 25, a widely used software for data analysis in research. Ethical Considerations: Ethical approval for the study was obtained from The Ethical Committee at Alzaim Alazhari University, Faculty of Medicine, and department of Biochemistry. All participants were fully informed about the purpose of the study and the procedures involved. Informed consent was obtained from all participants, ensuring their willingness to be part of the study. Confidentiality and security of participant data were maintained. All personal identifiers were removed prior to analysis to ensure participant anonymity, ensuring that the data was used solely for the purpose of the study. Participants were provided with feedback regarding their laboratory results. Approval to conduct the study was obtained from the managers of the two Hijamah centers, demonstrating institutional consent and support for the research.

Results:

This study included (58) Sudanese participants comprising 42 diagnosed with

Type 2 diabetes mellitus, and 16 apparently healthy individuals who served as controls. The study assessed the potential effects of Al-Hijamah (wet cupping) on glycemic control parameters. Among the diabetic group, 73.8% of participants reported noticeable improvement in their general health condition following Al-Hijamah therapy, whereas 26.2% did not perceive significant changes.

Regarding disease duration, the majority (81%) of diabetic patients had lived with diabetes for over ten years, while 38.9% had been diagnosed for 5-10 year; notably, no participants had a disease duration of less than five years.

Regarding medication usage, a considerable proportion of diabetic patients (81%) utilized medications alongside Al-Hijamah, while 19% relied solely on Al-Hijamah for their treatment.

The laboratory results, presented in Figures 1 to 5, depict the correlation and effects of Al-Hijamah on various biochemical parameters in the study population, focusing on diabetic groups and their respective controls.

The impact of cupping on glucose levels for diabetic patients and their controls is illustrated in figure (1); the mean glucose level for diabetic patients before cupping was 158.9 mg/dl, in the cup, the blood glucose level rose to 165.7 mg/dl, and one week after cupping, it decreased to 149 mg/dl, representing a purification index (PI) of 6.2%. Conversely, for the control group, the mean blood glucose level was 141 mg/dl before cupping, 117 mg/dl in the cup, and 127.4 mg/dl one week after cupping, resulting in a PI of 9.7%. This suggesed a mild but consistent reduction in glucose concentration following Al-Hijamah in both groups.

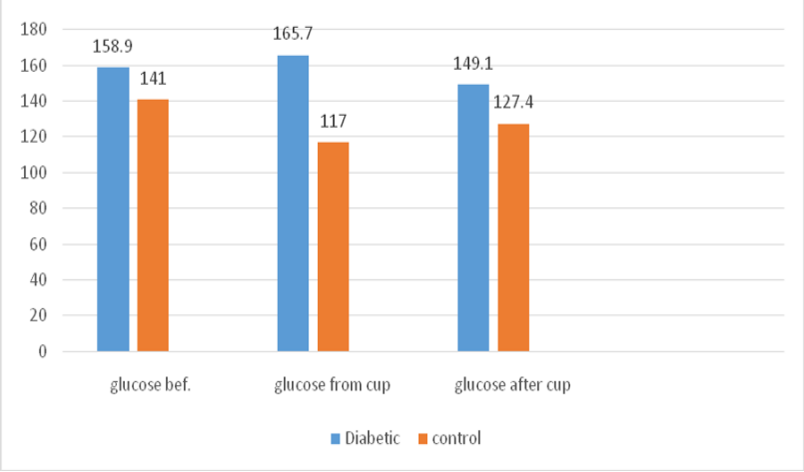

Figure (1): Effect of Hijamah on serum glucose level (mg/dl) in diabetic & control subjects

Regarding HbA1c levels, the purification index (PI) demonstrated a 4.6% improvement for diabetic patients and a 6.7% improvement for their control group. For diabetic patients, the mean HbA1c was 6.5% before cupping, 6.6% in the cup, and 6.2% after cupping. In comparison, the healthy control group had a mean HbA1c of 6% before cupping, 6.2% in the cup, and 5.6% after cupping. (Figure 2).

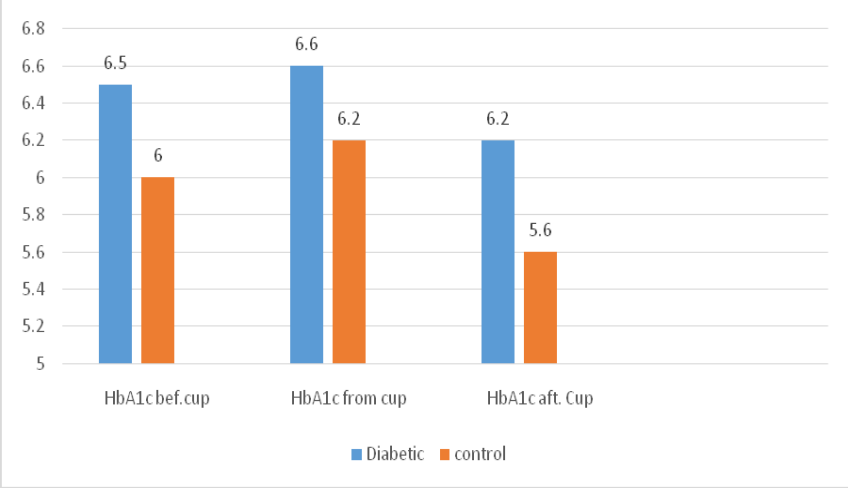

Figure (2): The effect of Hijamah on the purification index (PI) of HbA1c in diabetic and control participants

In patients with both diabetes and hypertension as (Sub group), there was a remarkable decrease in blood glucose levels, dropping from 303 mg/dl before cupping to 183 mg/dl after cupping, with an intermediate value of 265.5 mg/dl observed in the cup (Figure 3). This decrease in blood glucose was paralleled by a decline in HbA1c levels, where HbA1c decreased from 8.0% to 5.9% (Figure 4).

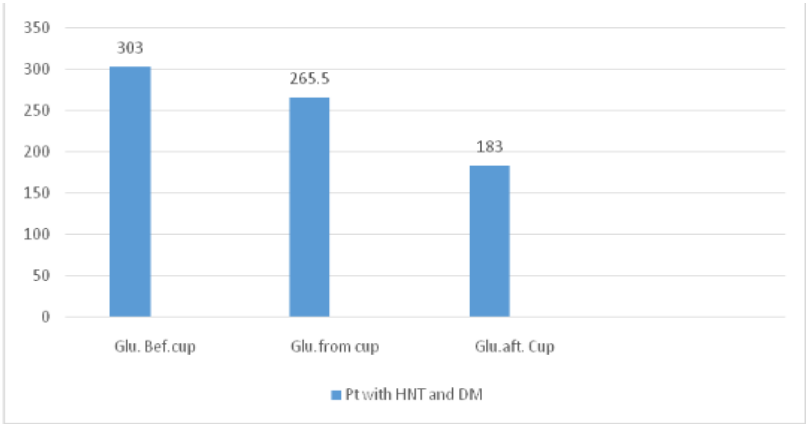

Figure (3): The effect of hijamah on serum glucose (mg/dl) in patient with HNT & DM

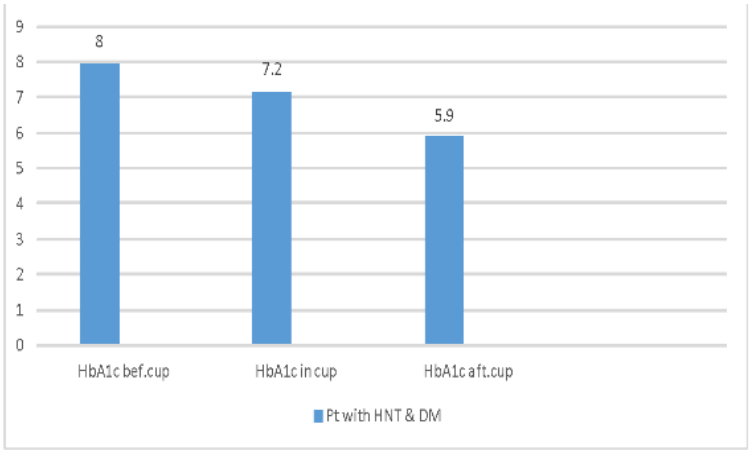

Figure (4): The effect of hijamah on HbA1c in patient with HNT and DM

Discussion

This study aimed to establish a comprehensive profile of Sudanese individuals undergoing wet cupping (Al-Hijamah) by assessing its effects on diabetic patients, focusing specifically on blood glucose level and HbA1c levels in type 2 diabetic patients and their respective control groups. The results obtained in this research present promising insights into the modulation of blood glucose and glycated hemoglobin levels through cupping therapy.

Al-Hijamah has shown therapeutic benefits in various diseases, including diabetes, either as a standalone treatment or in conjunction with pharmacological agents. Importantly, its mechanical nature means it does not chemically interact with drugs, minimizing the risk of antagonism and allowing it to serve as a potentiate standard therapies [11]. In our study, wet

cupping led to measurable improvements in diabetic patients' glucose and HbA1c levels, with purification indices (PIs) of 6.2% and 4.6%, respectively. These effects are consistent with Prophetic medicine teachings, such as those reported by Jaabir Ibn Abdullah and Abu Hurairah, highlighting Al-Hijamah as a source of healing [S1].

Interestingly, a notable proportion of diabetic patients (71.4%) and their controls (75%) had undergone multiple cupping sessions in the past. Those with repeated sessions showed slightly lower PIs, which may indicate that initial sessions provide more pronounced benefits or that metabolic responses diminish with repeated interventions. This observation raises the need for further studies to optimize the frequency and duration of Al-Hijamah sessions in diabetic populations.

Comparative analysis of diabetic patients and their controls revealed that controls exhibited a greater PI for glucose reduction (9.7%) than diabetic patients (6.2%), aligning with Mehadavi's findings [11]. This may indicate that while Al-Hijamah benefits both groups, individuals without chronic hyperglycemia respond more strongly to its detoxification effects.

Analyzing the laboratory findings for diabetic patients and their controls, we observed a decrease in glucose levels, with a PI of 6.2% for patients (Figure 1) and 9.7% for controls (Figure 2). These results were consistent with a previous study where the PI for glucose was reported to be 7%.[12] On the other hand, HgA1c was also decreased following Al-Hijama (Fig. 3& 4) this is in agreement with studies that reported 14.7% reduction in HbA1c. [13] (14.76%) compare to (4.6%) in our study we consider the difference in percentage is due to using aerobic exercise beside hijamah which increase the effects besides that the population were women only (we have men and women) [13].

In the case of individuals with both diabetes and hypertension, the study revealed a dramatic response to Al hijamah in terms of glucose and HbA1c levels, with PI values of 37% and 26.2%, respectively. This brings out the potential off Al-hijamah as an intervention for managing glucose levels in individuals with these comorbidities. These findings emphasize the need for further research and exploration of Al Hajarah's effects on various health parameters in different patient populations.

Overall, these findings reinforce the value of wet cupping as a conjunctive approach for managing blood glucose and HbA1c levels in diabetic individuals. Future studies should focus on session frequency, long-term effects, and mechanistic pathways to validate and expand upon these results.

Conclusion:

Al-hijamah is a promising adjunct in diabetes management, particularly for patients with poor glycemic control. However, further randomized studies with larger cohorts and long-term follow-up are essential to establish safety, efficacy, and optimal treatment frequency. Results obtained from this study showed that there was a decrease in glucose and HbA_{1c} level which should prevent long term complication of diabetes. The anti-diabetic effects of Al-hijamah e.g. blood clearance effects lipid profile, advanced glycation end products, glycosylated serum proteins and others makes it an essential line of treatment for both preventive and therapeutic purposes.

Recommendations

1. Investigate Lipid Profile in Diabetic Patients: In diabetic patients, future research should focus on analyzing lipid profiles. Since hyperglycemia can affect lipid metabolism, studying lipid parameters will contribute to a more comprehensive understanding of the effects of AL- hijamah in diabetes.

2. Collect Multiple Post-Al- Hijamah samples: Researchers should consider obtaining multiple blood samples at different intervals after Al-hijamah (e.g., immediately, one week, two weeks) to capture a comprehensive view of post-Al-hijamah effects. This approach will provide valuable data to determine the optimal timing for subsequent Al- hijamah sessions.

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