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Review Article

**A REVIEW ON THE EFFECTS OF WET-CUPPING
(HIJAMAT) ON FASTING BLOOD SUGAR****Azam Meyari¹, Fahimeh Ramezani Tehrani², Mahdi Biglarkhani^{3,4}, Roshanak Mokaberinejad⁵, Mojgan Tansaz^{5*}**

¹M.D, M.Sc. in Medical Education, Ph.D Candidate of Iranian Traditional Medicine, Department of Traditional Medicine, School of Traditional Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

²Professor, Head of Reproductive Endocrinology Research Center, Research Institute for Endocrine Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

³M.D, Ph.D Candidate of Iranian Traditional Medicine, Research Institute for Islamic and Complementary Medicine, School of Traditional Medicine, Iran University of Medical Sciences.

⁴Student Research Committee, Iran University of Medical Sciences

⁵M.D, Ph.D Assistant Professor Department of Traditional Medicine, School of Traditional Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Abstract:

Wet-cupping is an old procedure used for treating different disorders in ancient and nowadays it used for managing of pain, some dermal disorders and metabolic disorders. In this study we aimed to assess effectiveness of wet-cupping on blood sugar in clinical trials. A comprehensive literature search for all published studies using PubMed, Science direct, Medline, Ovid Google scholar and three Iranian Medical Databases was performed for English and Persian language studies from inception through to October 2016. The studies included should be clinical trials, cohort and case-control studies by using combinations of the terms including "Wet-cupping", "Hijamat", "diabetes", "glucose" and "blood sugar". All authors independently extracted information and evaluated methodological quality according to 'CONSORT' assessment checklist. The full manuscripts of all citations that were likely to meet our study objective were selected and obtained. In cases of duplicate publication, we selected the most recent and complete versions. From the 252 citations identified from electronic searches, at beginning, we found 25 related articles. Out of these articles 5 ones including 367 subjects meet our study objectives. These articles were not highly qualified. There was no significant difference on fasting blood sugar of those with normal blood sugar after wet-cupping; while the blood sugar of diabetes cases was decreased for a short period time; however it was not remained after a long term follow up. Although there is a diminished blood sugar of diabetes participants after wet-cupping, considering small number of clinical trials and methodological poor quality, the more studies is needed to confirm these changes.

Key Words: *Wet-Cupping, Hijamat, Fasting Blood Sugar, A Review.*

Corresponding author:**MojganTansaz,**

*M.D, Ph.D Assistant Professor Department of Traditional Medicine,
School of Traditional Medicine,
Shahid Beheshti University of Medical Sciences,
Tehran, Iran. Email: tansaz_mojgan@yahoo.com*

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INTRODUCTION:

Diabetes is the most common endocrine dysfunction that both its prevalence and incidence increasing in worldwide along with increasing obesity and urbanization [1]. Diabetes is resulting from pancreas beta cells destruction (diabetes mellitus type 1) or from inability to use of insulin effectively (diabetes mellitus type 2) and consequently blood glucose increases [2]. Abnormal islet cell function is a key of type 2 diabetes. In early disease stages, insulin production is normal or increased in absolute terms, but there is resistance to it. Gradually, in the glycemic phase, pancreatic islets cells can't release insulin adequately so blood glucose elevates [3]. This condition may lead to micro vascular and macro vascular complications such as cardiovascular diseases, end stage renal failure, blindness, amputation and hospitalization in the patient unless managed well [4]. Lifestyle intervention to impact physical activity and food intake is critical to diabetes mellitus management [5, 6]. Medical intervention consists of ant diabetic oral agents and insulin injectable. Complications of these drugs and the need for prolong drug use can sometimes cause patients and physicians to use other therapies. Recent studies have demonstrated the relationship between serum iron and diabetes type 2 [7, 8], Increasing of ferritin, important iron storage in the body, within the normal range, may predispose some chronic diseases like diabetes and cardiovascular disease [9-11]. Some studies have suggested that abnormalities in iron metabolism may cause insulin resistance, hyperinsulinemia, dyslipidemia, hypertension and central obesity [12-14]. Today, bloodletting is being restored in modern medicine as the most effective method of treating the increasingly frequent disorders caused by iron overloading [15]. In a few epidemiological studies demonstrated that the more ferritin of serum, the more incidence of type 2 diabetes [16, 17]. The effectiveness of repeated blood donation in decrease of insulin resistance has been reported [10, 18]. Wet cupping, mentioned as Hijamat intraditional medicine, also called full (bleeding) cupping is a procedure from thousands years ago in many countries such as Greece, Iran, china, India and Arabic countries and recently has been successfully used in many parts of world such as Asia, America and Europe [19, 20]. In wet-cupping practitioner make some small incisions after applying the suction cup and extrude blood by further suction. It may be apply for different purposes of treatment such as pain related diseases (including chronic muscle pain, generalized pain, infection pain, and neuralgia pain), improvement of asthma, neurodermatitis, facial paralysis and acne [21], immune modulatory effects in rheumatoid arthritis [22], management of hypertension [23, 24], and Hyperlipidemia [25, 26]. From literature,

we found some clinical trial reports on wet cupping therapy for diabetes, but there is no systematic review about the effect of the therapy. Therefore, this review aims to evaluate the effects of wet cupping on blood sugar changes in clinical trials.

MATERIALS AND METHODS:

Data Sources: The following databases from inception through to October 2016: MEDLINE, OVID, science direct, PubMed, Google scholar and three Iranian Medical Databases (Magiran, SID, Barakat knowledge network system) systematically were searched. In the English databases, we used two search phrases for cupping: wet cupping and Hijamat and three search phrases for diabetes: diabetes, glucose and blood sugar. First the search phrases used was based on wet-cupping and other three phrases. The two concepts were combined using the Boolean operator: "wet cupping" AND "diabetes", "wet cupping" AND "blood sugar", "wet cupping" AND "glucose", "Hijamat" AND "diabetes", "Hijamat" AND "blood sugar", "Hijamat" AND "glucose". Iranian phrases were used for wet-cupping and diabetes and blood sugar for Iranian databases.

Study Selection: We searched randomized controlled trials (RCTs), non-comparative clinical trials, prospective or retrospective cohort studies, and case-control studies restricted to English and Persian published papers from inception to October 2016. Studies were eligible if they had: (a) a study population, including diabetic subjects, (b) assessed blood glucose/sugar (c) used wet cupping. We also excluded: (a) non-human studies, reviews, commentaries, editorials, letters, meeting abstracts, case reports, and studies that did not measure blood sugar/glucose, (b) studies that had study population with type 1 diabetes and (c) studies that did not provide accurate and clear data or methods.

Data Extraction and Quality Assessment: Two reviewers, experts in Medical Education and traditional medicine (AM and MB), independently conducted a primary selection using the titles, abstracts, and keywords to exclude studies that clearly did not fulfill inclusion criteria. They independently read the full text of remaining papers to identify eligible articles. Disagreements between reviewers were resolved by discussion or, if necessary, by third reviewer (MT). Journals and authors were not blinded during study selection. The E.G modified Consolidated Standards of Reporting Trials (CONSORT) was used as a validated quality assessment checklist for clinical trials. All clinical trial papers were categorized in 4 groups including high, moderate, low and very low quality; studies with scores $\geq 70\%$ of the highest level of CONSORT checklist were considered as high, 40 to 70% as moderate and 20 to 40% as low and $< 20\%$ as very low quality.

Table 1: Characteristics of included studies

Trial	Enrollment patients/age		Diagnostic criteria	Mean FBS in intervention/control group	Intervention		Duration of treatment or follow up	Main objects	Main result
	Intervention	Control			Intervention	Control			
Zahraa T. Mashlool (27)	100; 20-70	35; 20-70	Healthy volunteers	145.4±80.9/ 89.3± 11.5	Wet cupping 1 time	No intervention	Before and after intervention	Effect of wet-cupping on serum glucose	Significant decrease in the level of serum glucose
Seyed Kazem Farahmand (28)	45/63; 18-65	54/63; 18-65	Patients with metabolic syndrome without following especial drug or dietary regimen or other diseases	114.4±54.2/ 134.9±76.1	Dietary such as control group + two times interscapular wet-cupping at the week 1 and 6 after	Dietary advice (provided a 500 kcal per day less than total energy expenditure for 12 weeks)	Onset and at the week 6 and 12 after intervention	lipid profile and anthropometric parameters of patients with metabolic syndrome	No statistically significant differences between the values of fasting blood glucose between the two groups or between times.
Ahmad Akbari (31)	30;	-	Diabetic patients	219.89±68.82 /-	Wet-cupping +conventional treatment	-	Before and 1 week after wet-cupping	Effect of cupping on blood factors and oxidative stress in diabetes type 2	Hemoglobin A1C, fasting blood sugar, blood sugar 2 hours after fasting showed significant decrease
Basses Refaat (30)	16; 18-25	-	Healthy young	81.36±15.5/ -	Wet-cupping at 2 consecutive months using six points on the back	-	Before and 30 minutes and 48 hours after wet cupping	determine the efficacy of wet-cupping on blood pressure, blood sugar, serum lipids	Fasting blood glucose wasn't significantly differed after intervention.
Fairouz K. Alshowaf (29)	30; 18-50	30; 18-50	Healthy subjects	87.0±22.4 /87.0±22.4	Wet cupping 1 time	No intervention	Blood pressure and biochemical factors were assayed before and 10 days after intervention	Effect of wet-cupping on hypertension and some serum biochemical	Although the mean fasting blood glucose decreased a little after intervention but it wasn't significant.

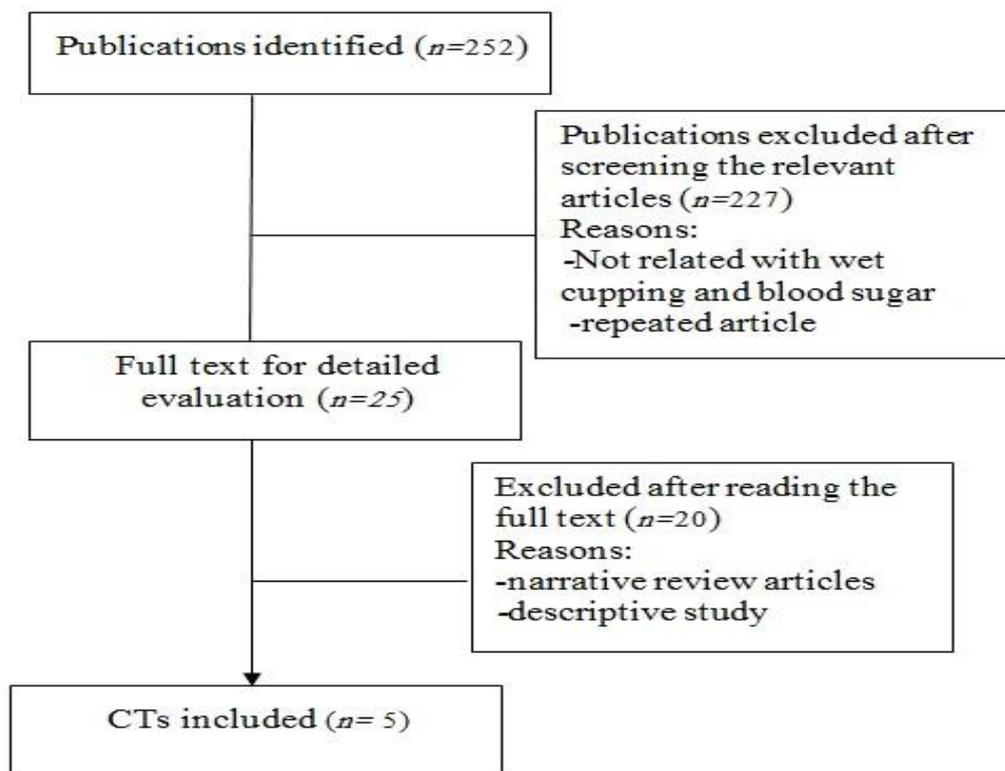


Fig1: The process of including and excluding studies

RESULTS:

Study Description: The literature searches revealed 252 articles, of which 247 studies had to be excluded (Figure 1). The majority (n=227) was excluded due to obvious ineligibility and repeated from reading title/abstract and full text of the 25 articles retrieved. At last, 5 articles included and rest of articles (n=20) were excluded after retrieving their full text and methods (descriptive or narrative reviews articles excluded). Five CTs met our inclusion criteria and their key data are listed in Table 1. Three of the included CTs were RC [27-29] and two of them were before & after Clinical Trial studies [30, 31]. Two of them originated from Iran [28, 31], other studies from Iraq [27], Yemen [29] and Saudi Arabia [30]. The intervention conditions were diabetic patients [31], metabolic patients [28] and healthy volunteers [27, 29 and 30].

Study Quality: All the included trials had clear description of the population, intervention and appropriate statistical and analytical methods. The sample size varied from 16 to 135 participants. Two RCTs employed the methods of randomization but none adopted both assessor and subject blinding. Sufficient details of dropouts and withdrawals were described in one RCT [28]. One of the trials described the randomization procedure, using random number table, and drawing [28].

Outcomes: One RCT [28] compared the effects of wet cupping and dietary advice with dietary advice only on coronary risk factors in patients with metabolic syndrome having increased mean fasting blood sugar and reported effects of intervention at baseline, 6 and 12 weeks after intervention. There was no statistically significant difference between the two groups ($P=0.766$) or between time points (pre cupping: 114.4 ± 54.2 , post cupping: 116.8 ± 46.9 , 121.2 ± 52.5 ; $P=0.176$). Another RCT [27] compared effect of wet cupping with no intervention on elevated fasting blood sugar in healthy men and suggested a significant difference in decrease of blood sugar immediately after wet-cupping (pre cupping: 145.4 ± 80 post cupping: 89.7 ± 18.3 ; $P < 0.05$). One before and after clinical trial [31], tested wet-cupping on elevated blood sugar in diabetes type 2 patients who had been received anti-diabetes oral agents from three weeks before intervention. This study showed statistically significant difference between fasting & postprandial blood sugar before and one week after wet-cupping (pre cupping: 219.89 ± 68.82 , post cupping: 180.2 ± 60.95 at fasting condition; $p = 0.0001$). The second before and after clinical trial [29] showed that although wet cupping decreases normal blood sugar after 10 days in healthy subjects (pre cupping: 87.0 ± 22.4 , post cupping: 81.5 ± 19.5), but it was not statistically significant

($P > 0.05$). In the last clinical trial [30], investigators showed no significant difference in the level of normal fasting blood sugar following 48 hours wet-cupping (pre cupping: 81.36 ± 15.5 , post cupping: 82.5 ± 12.4) in 16 young healthy men ($P > 0.05$). None of them reported severe adverse effects.

DISCUSSION:

Our study demonstrated that there was no significant difference on fasting blood sugar of those with normal blood sugar after wet-cupping; while the blood sugar of diabetes cases was decreased for a short period time; however it was not remained after a long term follow. Although we didn't find more original articles or systematic review about the effect of wet-cupping on blood sugar, the data suggest relationship between phlebotomy and blood sugar. Based on a few studies, prevalence of diabetes in blood donors is very lower than whole population (5% versus 20.8%)[32, 33]. A few epidemiological studies demonstrated that the more ferritin of serum, the more incidence of type 2 diabetes [16, 17]. Fernandez has showed in a cross-sectional, population-based study about two donors and non-donors groups, repeat blood donation (2-10 times) significantly decrease in insulin sensitivity and iron stores [18]. Although the exact mechanism of iron-induced diabetes is unknown, perhaps mediated by insulin deficiency, insulin resistance, and hepatic dysfunction [34]. Iron is a metal that can be easily oxidized and act as an oxidizing agent in the body [35]. Iron overload can oxidize and damage pancreas beta cells, disrupting insulin secretion. Also it is possible that iron overload causing resistance directly or through hepatic dysfunction [36]. Also another study showed significant difference between wet-cupping blood sugar and venous blood sugar through comparison between wet-cupping and epidural analgesia for pain controlling in patients with low back pain [37]. These studies confirm our results, although the methods, mechanisms and amount of bleeding are different. There are some limitations in this review. For example, the numbers of trials are too small and participants are too different to judge about diabetes treatment. Moreover, the methodological quality was often poor. Only three studies are randomized clinical trials and we assayed them based on the description of randomization, blinding, withdrawals and allocation concealment. Two of them applied randomization and only one of RCTs employed randomization, withdrawals and allocation concealment. All of studies have the same method but none of them attempted blinding. Although in cupping studies especially wet-cupping, blinding patients might be difficult, but assessor blinding can be achieved. Therefore low quality trials may overestimate the results.

CONCLUSIONS:

The data about effectiveness of wet-cupping on blood sugar is little and having low quality. However, primary outcomes suggest that wet-cupping can reduce high blood sugar in a short time but no significant difference in a long time period. Also wet cupping doesn't create significant difference on normal blood sugar in short time period. Further high quality studies of larger sample size and blindness are needed to confirm the effectiveness of wet cupping therapy in decreasing blood sugar and insulin resistance at short time and long time period after wet-cupping.

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