

Integrating Mid-Hijri Wet Cupping Therapy into Hypertension Treatment: A Quasi-Experimental Approach to Complementary Therapy

Mega Octavia^{1*}, Nurul Maziyyah¹, Elma Safitri²

¹Department of Pharmacology and Clinical Pharmacy, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia

²School of Pharmacy, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, Yogyakarta, Indonesia

Abstract. Complementary therapy has recently gained popularity in several countries, with some therapies widely used for disease prevention and treatment. Blood cupping is one such complementary therapy for hypertension. According to hadith, the optimal time for blood cupping is during the mid-Hijri months to manage blood pressure. This study aims to assess the effect of blood cupping performed during mid-Hijri months on hypertension outcomes. A quasi-experimental design with a one-group pretest-post-test approach was used. Samples were selected by purposive sampling. The study was conducted at a private clinic in Yogyakarta, Indonesia, involving 13 patients. Blood cupping therapy was administered twice: at the beginning and middle of the Hijri month. Outcomes were measured by changes in blood pressure. Paired T-tests compared blood pressure before and after cupping treatment. Results showed significant blood pressure changes with cupping at the beginning of Hijri (p-value of 0.004) and mid-Hijri (p-value of 0.000). Both treatments significantly reduced blood pressure, with average reductions of 9 mmHg for the beginning of Hijri and 7 mmHg for mid-Hijri. Thus, blood cupping therapy at the beginning of Hijri was more effective than at mid-Hijri.

Keywords: Blood cupping therapy, Hypertension, Mid-Hijri

1 Introduction

In 2018, Indonesia's Ministry of Health identified non-communicable diseases such as stroke, chronic kidney failure, arthritis, diabetes, and hypertension as serious health issues. Hypertension, often referred to as the "silent killer," poses significant risks due to its potential complications affecting other organs, necessitating effective management [1]. The incidence of hypertension in Indonesia has been increasing, with Ministry of Health data showing a rise in prevalence from 25.8% to 34.1% among individuals aged ≥ 18 years across various provinces [1]. Treatment options for hypertension complications include pharmacological, non-pharmacological, and complementary therapies. Complementary therapies, known for their affordability, notable therapeutic effects, and non-chemical nature, have gained popularity. Blood cupping is one such complementary therapy for hypertension [2]. Cupping therapy can help regulate aldosterone hormone levels, reducing blood flow through blood vessels. It stimulates arterial baroreflex sensitivity, enhancing the body's response to hypertension [3]. Research indicates that removing some blood through cupping can aid in treatment and blood cleansing [4].

The practice of blood cupping involves drawing blood from the skin through suction. However, according to Islamic medical science, cupping should not be performed haphazardly. This treatment needs to be carried out according to established medical standards to ensure its effectiveness [4]. Timing is crucial for cupping therapy. It is suggested that cupping should not be performed at the beginning of the month because blood levels have not yet fluctuated, and not at the end of the month due to reduced blood volume. The optimal time for cupping is in the middle of the month when blood levels are more volatile and increased [5]. Based on this understanding, this research investigates the impact of Al-Hijamah therapy, specifically when performed during the middle of the Hijri month, on blood pressure outcomes in individuals with hypertension.

This study aims to assess the effectiveness of blood cupping therapy administered during the mid-Hijri month and compare its effects on blood pressure in hypertension patients with those of cupping treatments carried out at different points in the Hijri month.

* Corresponding author: megaoctavia@umy.ac.id

2 Material and Method

2.1 Ethical clearance

This study has successfully undergone a comprehensive ethical review and received approval from the Ethics Board of the Faculty of Medicine and Health Sciences. The ethics committee at Universitas Muhammadiyah Yogyakarta issued the ethical clearance letter for this study under reference number 187/EC-KEPK FKIK UMY/IX/2019.

2.2 Method

This research adopted a quantitative approach, utilizing a quasi-experimental design to investigate the outcomes of the intervention. Specifically, it followed a one-group pretest-posttest model, where data was collected before and after the treatment to assess its impact on the participants.[5]. This quasi-experimental research involved an initial pretest (initial observation) before administering therapy, followed by a posttest (final observation) after the cupping therapy, which was performed for 10-15 minutes. The sample was obtained through total sampling. The research was carried out at Nur Hidayah Clinic from September 2019 to January 2020, involving a total of 13 patients. Patient medical record data were collected starting in September to November 2019. Inclusion criteria were patients diagnosed with hypertension who were willing to participate as respondents and were able to follow all research procedures. Pregnant women, individuals with diabetes, and those with blood cancer were not included in the study. Amlodipine 10 mg was prescribed daily to all subjects for hypertension management. Cupping therapy was carried out at the beginning of the Hijri month in December 2019 and again in the middle of the Hijri month in January 2020. Outcomes were measured by observing blood pressure at pretest and posttest. A paired t-test was applied to assess the impact of cupping therapy on clinical outcomes in hypertensive patients. Additionally, the mean difference was used to compare the effects of cupping performed at the beginning and in the middle of the Hijri month.

3 Result and Discussion

3.1 Patients characteristic

3.1.1 Age

According to the age classification system established by the Indonesian Ministry of Health, individuals were segmented into three specific age groups. The first group encompassed those aged 36 to 45 years, considered to be in late adulthood. The second group included people aged 46 to 55 years, who were classified as early elderly. The third group covers individuals aged 56 to 65 years who fell into the late elderly category. This categorization helped in understanding and addressing the different health and wellness needs

associated with these stages of aging. [6]. There were 6 patients in the category 46-55 years or early elderly with a percentage of 46.2% and 5 patients in the 56-65 years category or late elderly with a percentage of 38.5% (Table 1). In this study, there were 6 patients in the 46-55 years category (early elderly), accounting for 46.2%, and 5 patients in the 56-65 years category (late elderly), representing 38.5% (Table 1). Age is a major risk factor for hypertension, with the likelihood of developing the condition rising as people get older. This increased risk is attributed to structural alterations in large blood vessels that occur with aging. These changes include a narrowing of the vessel lumen and increased stiffness of the vessel walls, both of which contribute to elevated systolic blood pressure. [7].

Table 1. Patient Characteristics.

Variable	Frequency (n=13)	%
Age (year)		
Late Adult (36-45)	2	15.4
Early elderly (46-55)	6	46.2
Late elderly (56-65)	5	38.5
Gender		
Male	6	46.2
Female	7	53.8
Education		
Elementary School	1	7.7
Junior High School	3	23.1
Senior high School	7	53.8
University	2	15.4
Comorbid		
Dyspepsia	5	38.5
Hyperuricemia	2	15.4
No Comorbid	6	46.2

3.1.2 Gender

In this study, there were 6 male patients (46.2%) and 7 female patients (53.8%) (Table 1). Female more dominates hypertension in this study. According to Cortas, women who have not experienced menopause are protected by the estrogen hormone, which plays a role in increasing the levels of HDL (High-Density Lipoprotein) cholesterol [8]. A high level of HDL cholesterol is a protective factor in preventing the process of atherosclerosis. Atherosclerosis is a shrink in the diameter of blood vessels caused by plaque buildup on the surface of the artery wall. The blockages in blood vessels will cause the lumen (hole) in the blood vessels to become narrow, and the elasticity of the blood vessel walls gets to be weak, thereby causing high blood pressure [9]. Hypertension rates in premenopausal women are lower when compared to men of the same age cohort, whereas, after age 50, women have a higher rate of hypertension than men [10], [11].

3.1.3 Educational background

In this study, 1 patient (7.7%) had an elementary school education, 3 patients (23.1%) had a junior high school education, 7 patients (53.8%) had a senior high school education, and 2 patients (15.4%) had a college education (Table 1). These results indicated that the majority of patients had a senior high school education. Notoatmodjo stated that education level influences an individual's ability to receive and process information, which then affects their actions, whether positive or negative, for their well-being [12]. Actions taken after learning health-related information, particularly about hypertension, can impact health outcomes. A lower level of education is associated with reduced awareness of healthy behaviors and limited access to healthcare services [13].

3.1.4 Comorbid status

Among the 13 patients in this study, 5 patients (38.5%) had dyspepsia, 2 patients (15.4%) had hyperuricemia, and the remaining 6 patients (46.2%) had no comorbidities (Table 1). It is unclear whether the comorbid conditions were present before or after the hypertension diagnosis. Patients with hypertension and dyspepsia in this study were treated with omeprazole. Gudlaugsdottir et al. [9] have conducted research about hypertension that is commonly observed in patients with reflux esophagitis or Barrett's esophagus, whereas it is less prevalent in individuals with non-ulcer dyspepsia. The research indicated that hypertension is more prevalent among individuals with reflux esophagitis and Barrett's esophagus compared to those with non-ulcer dyspepsia.

Another comorbidity observed in hypertensive patients was hyperuricemia, which occurs when uric acid levels increase in the blood. Hyperuricemia, or elevated levels of uric acid in the blood, has been closely linked to a heightened risk of cardiovascular issues. It includes an increased likelihood of developing hypertension. Over time, research has consistently shown that high uric acid levels can contribute to various cardiovascular problems, including elevated blood pressure, by promoting inflammation and affecting vascular health [14]. In a study conducted by Mustafiza, it was found that there is a significant relationship between hyperuricemia and hypertension ($p = 0.000$). The study showed that patients with hyperuricemia are 16 times more likely to develop hypertension compared to those with normal uric acid levels. It suggests a strong association between the two conditions.[15].

3.2 Clinical outcome

3.2.1 The results of the difference in blood pressure after blood cupping therapy in early and mid-hijri

Table 2 displays the data regarding the variations in blood pressure readings pre- and post-cupping therapy.

This information provides insights into the potential effects of cupping therapy on blood pressure levels. The table shows that some patients did not experience a decrease in blood pressure following the therapy. After cupping therapy at the beginning of the Hijri month, it was observed that 4 patients, identified as L1, P2, L5, and P7, did not exhibit a decrease in blood pressure. However, during cupping therapy in the middle of the Hijri month, only 1 patient, coded as P3, did not show a reduction in blood pressure.

Table 2. Results of Difference in Blood Pressure after Blood Cupping Therapy in Early-Hijri and Mid-Hijri.

Patients	Cupping at early Hijri		Difference	Cupping at Mid-Hijri		Difference
	TD systole			TD systole		
	Before	After		Before	After	
P1	140	130	10	140	135	5
L1	130	130	-	145	135	10
L2	160	150	10	135	130	5
P2	130	130	-	140	130	10
P3	130	110	20	130	130	-
L3	160	130	30	140	135	5
L4	158	150	8	150	148	2
L5	130	130	-	135	130	5
P4	140	135	5	130	120	10
P5	140	130	10	140	130	10
P6	140	130	10	140	130	10
P7	130	130	-	140	130	10
L6	160	150	10	150	145	5

Setyawan and Budiyaniti state that applying suction during cupping therapy activates nerves within the skin.[16]. The stimulation reaches the posterior horn of the spinal cord, where it is transmitted via A-delta and C nerve fibers. From there, it progresses along the spinothalamic tract to the thalamus. In this region, endorphins are generated—small peptides that are released into the hypothalamus, which enhance mood and create a calming and relaxing effect. When a person feels happy and calm, the body naturally relaxes, leading to a decrease in heart rate. As the heart rate decreases, cardiac output slows as well. Since cardiac output is one of the factors influencing blood pressure, this reduction helps lower blood pressure. [17].

In this study, some patients did not experience a decrease in blood pressure. It may have occurred because the patients were not fully relaxed and calm during the cupping process, especially for those undergoing cupping therapy for the first time. Even though patients were prepared by relaxing for 15 minutes before the therapy, some of them did not experience any decrease in their blood pressure.

3.2.2 The analysis of blood cupping therapy for reducing patients' blood pressure

As shown in Table 3, cupping therapy at the beginning of the Hijri month resulted in an average decrease in patients' blood pressure from 142 mmHg to 133 mmHg. The lowest before-after average was from 130 mmHg to 110 mmHg, while the highest before-after average was from 160 mmHg to 150 mmHg. Similarly, cupping therapy conducted in the middle of the Hijri month

showed an average decrease in blood pressure from 139 mmHg to 132 mmHg. The lowest before-after average was from 130 mmHg to 120 mmHg, while the highest before-after average was from 150 mmHg to 148 mmHg. These results indicated a general reduction in patients' blood pressure following cupping therapy, as demonstrated by the mean, lowest, and highest values in both the early and mid-Hijri treatments.

Table 3. Analysis of Blood Cupping Therapy for Reducing Patient Blood Pressure.

Variables	Times	Mean \pm SD	Min	Max
Early Hijri Cupping	Before	142 \pm 13	130	160
	After	133 \pm 11	110	150
Mid-Hijri Cupping	Before	139 \pm 6	130	150
	After	132 \pm 7	120	148

Cupping therapy can trigger inflammatory reactions, which suggest mast cell damage and the release of compounds such as serotonin, histamine, bradykinin, and other unknown substances. These chemicals lead to the expansion of capillaries and arterioles, causing a flare in the treated area. Nitric oxide (NO), which is crucial for relaxation, helps smooth muscles relax and dilates blood vessels, ultimately lowering blood pressure.[17].

3.2.3 The effectiveness of blood cupping therapy in early hijri and mid-hijri toward clinical outcome of patients with hypertension

The results of the paired T-Test for cupping therapy in early Hijri indicated a p-value of 0.004, demonstrating statistical significance. In comparison, the mid-Hijri cupping therapy showed a very strong significance with a p-value of 0.000. Both values, being under 0.05, indicated that cupping therapy had a meaningful effect on the clinical outcomes of hypertension patients.

The average blood pressure reduction during early Hijri was 9 mmHg, compared to 7 mmHg in mid-Hijri. It suggests that the average blood pressure following cupping therapy in mid-Hijri was lower than that after early Hijri treatment. These findings suggest that cupping therapy is more effective at reducing blood pressure when administered during early Hijri rather than mid-Hijri.

This difference may be due to the use of the same patients for both therapies, indicating that the effect of cupping therapy in early Hijri could have influenced the results of the mid-Hijri therapy. It aligns with the research of Lee et al. [18], whose Randomized Controlled Trial (RCT) study demonstrated that a single cupping therapy can significantly reduce blood pressure by increasing vascular compliance and enhancing vascular filling.

Table 4. The Effectiveness of Blood Cupping Therapy in Early-Hijri and Mid-Hijri toward the Clinical Outcome of Patients with Hypertension.

Variables	Time	Difference in Mean	P
Early Hijri Cupping	Before After	9	0.004*
Mid-Hijri Cupping	Before After	7	0.000*

The limitations of this study include a small sample size and the limited availability of relevant references. Additionally, some confounding factors could not be controlled by the researchers due to limited authority over patient care.

4 Conclusion

The study concludes that blood cupping therapy, whether performed in early or mid-Hijri, significantly impacted the clinical outcomes of hypertension patients, with p-values of 0.004 and 0.000, respectively. However, the therapy administered during early Hijri proved to be more effective, showing a greater decrease in average systolic blood pressure—9 mmHg in early Hijri compared to 7 mmHg in mid-Hijri.

References

1. Kementerian Kesehatan Republik Indonesia, Hasil Utama Riskesdas 2018 (Kementerian Kesehatan RI, Jakarta, 2018).
2. M. Adib and A. K. Wardani, Pengetahuan Praktis Ragam Penyakit Mematikan Yang Paling Sering Menyerang Kita (Buku Biru, Yogyakarta, 2011).
3. T. S. Aboushanab and S. AlSanad, Cupping Therapy: An Overview from a Modern Medicine Perspective, *J. Acupunct. Meridian Stud.*, **11**, 83–87 (2018). doi:10.1016/j.jams.2018.02.001
4. S. A. Salim, Ensiklopedi Pengobatan Islam (Pustaka Arafah, Solo, 2012).
5. N. Tharayarah, Buku Pintar Sains Dalam Al-Qur'an, III (Percetakan Zaman, Jakarta, 2014).
6. T. M. Windri, A. Kinasih, and T. P. E. Sanubari, Pengaruh Aktivitas Fisik Dengan Kualitas Hidup Lansia Hipertensi Di Panti Wredha Maria Sudarsih Ambarawa, *J. Mitra Pendidik. (JMP Online)*, **3**, 1444–1451 (2019).
7. D. Amanda and S. Martini, The Relationship between Demographical Characteristic and Central Obesity with Hypertension, *J. Berk. Epidemiol.*, **6**, 43–50 (2018) doi: 10.20473/jbe.v6i12018.43-50.
8. L. N. Raihan and A. P. Dewi, Faktor-Faktor Yang Berhubungan Dengan Kejadian Hipertensi Primer Pada Masyarakat Di Wilayah Kerja Puskesmas Rumbai Pesisir, *JOM PSIK*, **1**, 1, (2014).
9. S. Gudlaugsdottir, W. M. M. Verschuren, J. Dees, T. Stijnen, and J. H. P. Wilson, Hypertension is frequently present in patients with reflux esophagitis or Barrett's esophagus but not in those

- with non-ulcer dyspepsia, *Eur. J. Intern. Med.*, **13**, 369–375 (2002) doi: 10.1016/S0953-6205(02)00090-0.
10. M. L. Muiesan and others, Cardiac and vascular structural changes. Prevalence and relation to ambulatory blood pressure in a middle-aged general population in northern Italy: the Vobarno Study, *Hypertens. (Dallas, Tex. 1979)*, **27**, 1046–1052, (1996) doi: 10.1161/01.hyp.27.5.1046.
 11. E. J. Benjamin and others, Heart Disease and Stroke Statistics-2018 Update: A Report From the American Heart Association, *Circulation*, **137**, 67–492 (2018) doi: 10.1161/CIR.0000000000000558.
 12. S. Notoatmodjo, *Ilmu Perilaku Kesehatan*, (Rineka Cipta, Jakarta, 2014).
 13. A. Zajacova and E. M. Lawrence, *HHS Public Access, Annu. Rev. Public Heal.*, **40**, 273–289 (2019) doi: 10.1146/annurev-publhealth-031816-044628.
 14. D. J. Stewart, V. Langlois, and D. Noone, Hyperuricemia and Hypertension: Links and Risks, *Integr. Blood Press. Control*, **12**, 43–62 (2019) doi: 10.2147/IBPC.S184685.
 15. P. V Mustafiza, *Hubungan antara Hiperurisemia dengan Hipertensi*, (Universitas Sebelas Maret, Solo, 2010).
 16. A. Setyawan, D. N. A. Sari, and G. A. Budiati, Efektifitas dan Mekanisme Bekam dalam Menurunkan Nilai Mean Arterial Pressure pada Pasien Hipertensi, *J. Ilmu Kesehat. Masy.*, **12**, 727–734 (2020).
 17. D. DeMers and D. Wachs, *Physiology*, (Mean Arterial Pressure. Treasure Island, 2022).
 18. M. S. Lee, J.-I. Kim, and E. Ernst, Is cupping an effective treatment? An overview of systematic reviews, *J. Acupunct. Meridian Stud.*, **4**, 1–4 (2011) doi: 10.1016/S2005-2901(11)60001-0.