

## ASSESSING THE COMBINED EFFECTS OF HAMSTRING CUPPING THERAPY WITH CONVENTIONAL TREATMENT IN KNEE OSTEOARTHRITIS AT HUE TRADITIONAL MEDICINE HOSPITAL

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### ABSTRACT

**Background:** Knee osteoarthritis (KOA) is a common chronic condition among middle-aged and elderly individuals, characterized by pain, limited mobility, and reduced quality of life. Cupping therapy applied to the hamstring muscles has been shown to promote muscle relaxation, enhance circulation, and alleviate pain; however, clinical research on this intervention remains limited in Vietnam. Therefore, we conducted this study to evaluate the effectiveness of hamstring cupping therapy combined with conventional treatment in patients with KOA at the Hue Traditional Medicine Hospital.

**Methods:** A controlled clinical intervention study, was conducted on 84 patients with knee osteoarthritis (KOA) stage I, II, divided into two groups (42 patients each). Group 1 received Hamstring cupping therapy combined with electroacupuncture and the herbal formula Du Huo Ji Sheng Tang, while Group 2 was treated with electroacupuncture and the herbal formula only. Clinical outcomes including VAS, ROM, WOMAC score, and Traditional Medicine syndromes were evaluated at D0, D5, D10, and D15.

**Results:** The cupping group showed superior effectiveness: VAS decreased by  $-5.3 \pm 1.0$  compared to  $-3.2 \pm 1.6$ ; ROM increased by  $+19.9 \pm 11.0^\circ$  compared to  $+8.6 \pm 11.1^\circ$ ; and the WOMAC score decreased by  $-33.5 \pm 12.7$  compared to  $-25.3 \pm 12.1$  ( $p < 0.05$ ). Traditional Medicine syndromes improved in both groups, with better outcomes in the Intervention group; no significant adverse effects were recorded.

**Conclusion:** Hamstring cupping therapy combined with conventional treatment effectively reduces pain, improves function, and is safe, suggesting potential for clinical application.

**Key words:** knee osteoarthritis; Cupping therapy, hamstring muscle, electroacupuncture, Du Huo Ji Sheng Tang, traditional medicine.

### I. INTRODUCTION

Knee osteoarthritis (KOA) is a condition that progresses insidiously, leading to delayed detection or being underestimated by many patients. The disease commonly causes pain and joint deformity, follows a chronic course, and may ultimately result in disability if not diagnosed early and managed appropriately. According to the Global Center for Disease Control and Prevention in 2023, more

than 22% of adults over 40 years of age worldwide are affected by KOA [1]. In Vietnam, although the prevalence of knee osteoarthritis has not been consistently reported, the rate of knee pain has been documented at 18% among individuals aged 16 years and older [2].

In recent years, significant advances in the management of KOA using traditional medicine have been recognized due to its favorable

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efficacy and low complication rates. In traditional medicine, KOA corresponds to the category of “bi syndrome”, which is attributed to the invasion of wind, cold, and dampness, leading to stagnation of qi and blood and resulting in pain and impaired joint mobility [3]. Conventional therapeutic approaches include electro-acupuncture and herbal prescriptions. In addition, cupping therapy has been increasingly applied because of its effectiveness in pain reduction, safety, and supportive role in functional rehabilitation. Notably, the hamstring muscles play a crucial role in stabilizing and facilitating knee joint movement; interventions targeting this muscle group can enhance circulation, reduce muscle tension, and improve the range of motion [4].

However, there is currently a lack of local studies assessing the therapeutic effects of hamstring cupping therapy in patients with KOA. To address this gap, we conducted the present study with the following objectives: To assess the effectiveness of hamstring cupping therapy in combination with conventional treatment for knee osteoarthritis at Hue Traditional Medicine Hospital.

## **II. SUBJECTS AND METHODS**

### **2.1. Study subjects**

Patients diagnosed with knee osteoarthritis, hospitalized at Hue Traditional Medicine Hospital, who voluntarily agreed to participate in the study.

**Inclusion criteria:** According to Modern Medicine: patients diagnosed with primary KOA based on the American College of Rheumatology (ACR, 1991) criteria [5]. Radiographic findings consistent with Kellgren–Lawrence grade I or II lesions (1957) [6]. According to Traditional Medicine: Patients diagnosed with KOA classified as Wind-Cold-Damp Bi syndrome.

**Exclusion criteria:** Patients with other inflammatory lesions of the knee; those who self-administered additional anti-inflammatory or analgesic medications during the study period; patients with aphasia, speech disorders, or psychiatric conditions; pregnant women; radiographic KOA classified as grade III or IV according to Kellgren-Lawrence; KOA classified as Wind-Heat-Damp Bi syndrome in Traditional Medicine; or those who discontinued treatment for  $\geq 3$  days.

### **2.2. Research methods**

**Study design:** A quasi-experimental controlled study (non-randomized) was conducted. Patients were allocated into two comparable groups using matching criteria (age, sex, radiographic grade).

**Sample size:** A total of 84 patients (included by convenience sampling) who met the eligibility criteria were included in the study. Only one knee - the more symptomatic side - was selected for each participant.

**Group 1 (Intervention group):** 42 patients (42 knees) received hamstring cupping therapy combined with conventional treatment (electroacupuncture and herbal prescription).

**Group 2 (Control group):** 42 patients (42 knees) received conventional treatment only (electroacupuncture and herbal prescription).

**Data collection:** All patients underwent clinical and paraclinical examinations, and study records were completed using a standardized form. After meeting the inclusion and exclusion criteria, patients were allocated into two groups and treated for 15 consecutive days:

**Group 1 (n = 42):** Hamstring cupping therapy + electroacupuncture + Du Huo Ji Sheng Tang.

**Group 2 (n = 42):** Electroacupuncture + Du Huo Ji Sheng Tang.

The interventions were performed in the following order: electroacupuncture, cupping, and herbal medication.

**Electroacupuncture:** Acupoints included Dubi (ST35), Neixiyan (EX-LE4), Liangqiu (ST34), Xuehai (SP10), Yinlingquan (SP9), Yanglingquan (GB34), Zusanli (ST36), and Sanyinjiao (SP6). Each session lasted 25 minutes, performed once daily for 15 days.

**Hamstring cupping therapy (Group 1 only):** dry cupping was applied to the hamstring region of the affected limb for 15 minutes per session, once daily. Each treatment course lasted 5 days, and each patient received three treatment courses. Performed by trained practitioners.

**Du Huo Ji Sheng Tang (herbal prescription):** Prepared following the classical formula, decocted and packaged at a dose of 200 mL per pouch. Each patient consumed two pouches per day, taken 30 minutes after breakfast and dinner, for a total of 15 days.

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Evaluation: Clinical indicators (VAS, ROM, WOMAC) and Traditional Medicine symptom assessments were recorded at four time points: baseline (D0), after 5 days (D5), after 10 days (D10), and after 15 days (D15).

Monitoring for adverse events:

Electroacupuncture: needle dizziness, needle breakage, local hematoma, infection;

Cupping therapy: burning sensations, sharp pain at the cupping site, erythematous rash;

Du Huo Ji Sheng Tang: abdominal pain, nausea, diarrhea, allergic rash.

### 2.3. Data analysis

Data were analyzed using SPSS version 20.0, with statistical significance set at  $p < 0.05$ .

### 2.4. Ethical considerations

The study was approved by the Ethics Committee in Biomedical Research of the University of Medicine and Pharmacy, Hue University (Approval No. H2023/415, dated June 2, 2023).

## III. RESULTS

### 3.1. Characteristics of the study subjects

The age group  $\geq 70$  years accounted for the highest proportion of the total patients, with the majority being female. Most patients had a BMI in the overweight range (23.0 - 24.9 kg/m<sup>2</sup>), with a mean BMI of  $23.0 \pm 2.5$  kg/m<sup>2</sup>. The majority of the study subjects were engaged in manual labor. Most patients had a disease duration of 1 year or longer (Table 1).

**Table 1:** General characteristics of the study subjects (n = 84)

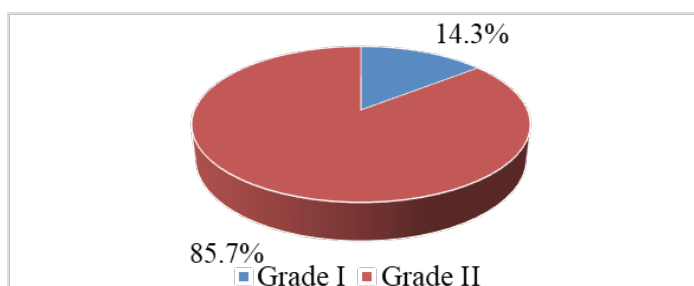
Characteristics		Quantity	Ratio (%)
Age	$\leq 49$	1	1.2
	50 - 59	19	22.6
	60 - 69	25	29.8
	$\geq 70$	39	46.4
	Mean $\pm$ SD	67.9 $\pm$ 9.3	
Gender	Male	14	16.7
	Female	70	83.3
BMI	Underweight	7	8.3
	Normal	30	35.7
	Overweight	39	46.5
	Obese	8	9.5
	Mean $\pm$ SD	23.0 $\pm$ 2.5	
Type of Labor	Mental labor	15	17.9
	Manual labor	69	82.1
Duration of disease	< 1 year	15	17.9
	1 - 5 years	34	40.5
	6 - 10 years	22	26.2
	> 10 years	13	15.5

The most common clinical symptoms observed in the study subjects were increased pain during movement (100%), limited knee joint range of motion (90.5%), morning stiffness (90.5%), knee crepitus (86.9%), and Clarke's sign (83.3%) (Table 2).

**Table 2:** Selected clinical symptoms before treatment (n = 84)

Clinical Symptoms	Quantity	Ratio (%)
Pain increases with activity, decreases with rest	84	100
Limited knee joint range of motion	76	90.5
Morning stiffness after lying down or resting	76	90.5
Knee crepitus	73	86.9
Clarke's sign	70	83.3

The majority of patients were classified as having Grade II lesions on X-ray (85.7%) (Figure 1).



**Figure 1:** Severity of knee joint damage on X-ray by Kellgren-Lawrence grade (n = 84)

### 3.2. Treatment Outcomes

After 5, 10, and 15 days of treatment, pain intensity measured by the VAS gradually decreased in both study groups. The mean VAS scores at days 5, 10, and 15 showed a significant decline compared to baseline (D0), accompanied by a progressive increase in score reduction over time. Notably, group 1 demonstrated superior improvement in both the mean VAS scores and the magnitude of score reduction compared to group 2 after 15 days of treatment, with the difference reaching statistical significance ( $p < 0.05$ ) (Table 3).

**Table 3:** Comparison of VAS pain score changes between the two study groups

Characteristics		Group 1 (n = 42)		Group 2 (n = 42)		p1-2*
		Mean ± SD	Median1	Mean ± SD	Median2	
Time point	D0	6.8 ± 1.0	6.0	6.9 ± 1.0	6.0	0.826
	D5	4.9 ± 1.9	6.0	5.9 ± 1.3	6.0	0.030
	D10	3.5 ± 2.0	3.0	4.7 ± 1.7	5.0	0.007
	D15	1.4 ± 1.2	2.0	3.7 ± 2.0	4.0	< 0.001
Score reduction	ΔD5 - D0	-1.9 ± 1.5	2.0	-1.0 ± 1.0	1.0	0.004
	ΔD10 - D0	-3.3 ± 1.7	3.0	-2.1 ± 1.3	1.5	0.001
	ΔD15 - D0	-5.3 ± 1.0	6.0	-3.2 ± 1.6	3.5	< 0.001
p D5-D0**			< 0.001		< 0.001	
p D10-D0**			< 0.001		< 0.001	
p D15-D0**			< 0.001		< 0.001	

Notes: \*Mann-Whitney U test was used. \*\*Wilcoxon Signed-Rank test was used.

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After 5, 10, and 15 days of treatment, knee joint range of motion increased in both study groups. The mean range of motion at days 5, 10, and 15 showed a progressive increase compared to baseline (D0), with the magnitude of score increase rising over time in both groups. Notably, group 1 demonstrated superior improvement in both the mean scores and the magnitude of score increase in knee joint range of motion compared to group 2 after 15 days of treatment, with the difference reaching statistical significance ( $p < 0.05$ ) (Table 4).

**Table 4:** Comparison of changes in knee joint range of motion between the two study groups

Characteristics		Group 1 (n = 42)		Group 2 (n = 42)		p1-2*
		Mean ± SD	Median1	Mean ± SD	Median2	
Time point	D0	114.9 ± 12.5	120.0	120.3 ± 9.6	119.0	0.057
	D5	123.5 ± 10.9	125.0	122.6 ± 12.1	120.0	0.019
	D10	130.8 ± 9.2	130.0	125.1 ± 8.5	130.0	0.002
	D15	134.8 ± 9.8	130.0	128.8 ± 8.1	130.0	0.001
Score increase	ΔD5 - D0	8.6 ± 10.7	5.0	2.3 ± 6.6	0.0	< 0.001
	ΔD10 - D0	16.0 ± 11.1	15.0	4.8 ± 8.0	5.0	< 0.001
	ΔD15 - D0	19.9 ± 11.0	20.0	8.6 ± 11.1	9.0	< 0.001
p D5-D0**			< 0.001		0.069	
p D10-D0**			< 0.001		0.001	
p D15-D0**			< 0.001		< 0.001	

Notes: \*Mann-Whitney U test was used. \*\*Wilcoxon Signed-Rank test was used.

After 5, 10, and 15 days of treatment, WOMAC scores decreased progressively from baseline (D0) in both groups, with greater reductions over time. By day 15, group 1 showed significantly greater improvement in mean WOMAC scores and score reduction compared to group 2 ( $p < 0.05$ ) (Table 5).

**Table 5:** Comparison of WOMAC knee dysfunction changes between the two study groups

Characteristics		Group 1 (n = 42)		Group 2 (n = 42)		p1-2
		Mean ± SD	Median1	Mean ± SD	Median2	
Time point	D0	44.1 ± 13.1	44.0	44.4 ± 12.2	45.0	0.918***
	D5	31.6 ± 13.6	30.0	35.0 ± 14.0	35.0	0.255***
	D10	19.5 ± 10.8	20.5	25.8 ± 12.0	24.5	0.009*
	D15	10.6 ± 8.4	9.5	19.1 ± 10.9	16.0	0.001*
Score reduction	ΔD5 - D0	-12.5 ± 10.7	-9.5	-9.4 ± 9.4	-6.5	0.139*
	ΔD10 - D0	-24.7 ± 12.1	-22.5	-18.5 ± 11.6	-17.5	0.029*
	ΔD15 - D0	-33.5 ± 12.7	-32.0	-25.3 ± 12.1	-26.0	0.003***
p D5-D0			< 0.001****		< 0.001****	
p D10-D0			< 0.001**		< 0.001****	
p D15-D0			< 0.001**		< 0.001**	

Notes: \*Mann - Whitney U test was used.

\*\*Wilcoxon Signed-Rank test was used.

\*\*\*Independent Sample T test was used.

\*\*\*\*Paired T test was used.

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After 15 days of treatment, participants showed significant improvements in complexion, tongue color and coating, aversion to wind and cold, limb numbness and heaviness, sleep quality, and nocturia within each group ( $p < 0.05$ ). However, no significant differences were observed between the two groups ( $p > 0.05$ ) (Table 6).

**Table 6:** Changes in selected traditional medicine symptom patterns after treatment

Symptoms		Group 1 (n = 42)		Group 2 (n = 42)		p1-2* (D15)
		D0	D15	D0	D15	
		n (%)	n (%)	n (%)	n (%)	
Complexion	Rosy and lustrous	10 (23.8)	32 (76.2)	10 (23.8)	28 (66.7)	0.334
	Pale	32 (76.2)	10 (23.8)	32 (76.2)	14 (33.3)	
	p**	p (D15 - 0) < 0.001		p (D15 - 0) < 0.001		
Tongue color	Rosy and lustrous	15 (35.7)	33 (78.6)	15 (35.7)	33 (78.6)	1.000
	Pale	27 (64.3)	9 (21.4)	27 (64.3)	9 (21.4)	
	p**	p (D15 - 0) < 0.001		p (D15 - 0) < 0.001		
Tongue coating	Thin	22 (52.4)	38 (90.5)	22 (52.4)	38 (90.5)	1.000
	Thick	20 (47.6)	4 (9.5)	20 (47.6)	4 (9.5)	
	p**	p (D15 - 0) < 0.001		p (D15 - 0) < 0.001		
Aversion to wind	Yes	37 (88.1)	8 (19.0)	38 (90.5)	10 (23.8)	0.595
	No	5 (11.9)	34 (81.0)	4 (9.5)	32 (76.2)	
	p**	p (D15 - 0) < 0.001		p (D15 - 0) < 0.001		
Aversion to cold	Yes	36 (85.7)	5 (11.9)	37 (88.1)	7 (16.7)	0.533
	No	6 (14.3)	37 (88.1)	5 (11.9)	35 (83.3)	
	p**	p (D15 - 0) < 0.001		p (D15 - 0) < 0.001		
Numbness and a heavy sensation in all four limbs	Yes	40 (95.2)	7 (16.7)	38 (90.5)	25 (59.5)	0.192
	No	2 (4.8)	35 (83.3)	4 (9.5)	17 (40.5)	
	p**	p (D15 - 0) < 0.001		p (D15 - 0) < 0.001		
Sleep quality	Good	20 (47.6)	36 (85.7)	18 (42.9)	37 (88.1)	0.746
	Poor	22 (52.4)	6 (14.3)	24 (57.1)	5 (11.9)	
	p**	p (D15 - 0) < 0.001		p (D15 - 0) < 0.001		
Nocturia	Yes	26 (61.9)	22 (52.4)	27 (64.3)	23 (54.8)	0.827
	No	16 (38.1)	20 (47.6)	15 (35.7)	19 (45.2)	
	p**	p (D15 - 0) = 0.250		p (D15 - 0) = 0.219		
Pulse	Floating	5 (11.9)	5 (11.9)	5 (11.9)	5 (11.9)	1.000
	Deep	37 (88.1)	37 (88.1)	37 (88.1)	37 (88.1)	
	p**	p (D15 - 0) - 1.000		p (D15 - 0) - 1.000		

Notes: \*Chi-squared test was used. \*\* McNemar test was used.

### **3.3. Adverse events during the treatment process**

Throughout the treatment period, no adverse events were reported. Specifically: Cupping therapy did not cause burning sensation, sharp pain at the cupping sites, or skin erythema. Electroacupuncture did not induce any adverse reactions such as needle fainting, needle breakage, post-needling hematoma, or infection. Du Huo Ji Sheng Tang decoction did not cause abdominal pain, nausea, diarrhea, or allergic skin reactions.

## **IV. DISCUSSION**

The majority of patients were aged  $\geq 50$  years (97.6%), consistent with the degenerative nature of knee osteoarthritis (KOA). Age-related cartilage deterioration, reduced collagen and proteoglycan synthesis, and subchondral bone sclerosis contribute to increased disease severity and functional limitation [7]. Females accounted for 83.3%, reflecting the higher risk in postmenopausal women. Most patients were engaged in manual labor (82.1%), a known risk factor due to repetitive mechanical stress on the knee joint. Over half of the patients were overweight or obese (56%), further contributing to joint degeneration. Disease duration was most commonly 1 - 5 years or 6 - 10 years, suggesting delayed healthcare-seeking behavior.

All patients presented with typical KOA symptoms, including activity-related pain (100%), limited range of motion (90.5%), morning stiffness (90.5%), crepitus (86.9%), and positive Clarke's sign (83.3%), consistent with ACR criteria [5] and previous studies [8]. Radiographically, most patients were classified as Kellgren - Lawrence grade II (85.7%), indicating that many sought care at a moderate stage of disease.

Both groups showed significant improvement in VAS, ROM, and WOMAC scores over 15 days. However, the intervention group demonstrated greater reductions in pain (VAS: -5.3 vs -3.2), greater improvement in ROM (+19.9° vs +8.6°), and larger WOMAC reduction (-33.5 vs -25.3) ( $p < 0.05$ ). These findings suggest that adding hamstring cupping to conventional treatment enhances short-term clinical outcomes, possibly through improved circulation, muscle relaxation, and reduced stiffness [9].

Traditional medicine symptoms improved significantly within each group, including reductions in aversion to wind and cold, limb heaviness, and signs of qi-blood deficiency. However, no significant differences were observed between groups at D15, indicating that the additional effect of cupping on these parameters remains unclear. The modest improvement in nocturia and minimal changes in pulse may be related to the short treatment duration.

No adverse events were recorded during the study period. This study has several limitations. First, the quasi-experimental, non-randomized design may introduce selection bias despite efforts to ensure baseline comparability. Second, the sample size was relatively small and not calculated a priori, which may limit statistical power. Third, the short follow-up period (15 days) only allows assessment of short-term outcomes, without evaluating long-term efficacy or safety. In addition, the assessment of traditional medicine symptoms remains partly subjective and showed no significant differences between groups. Therefore, further randomized controlled trials with larger sample sizes and longer follow-up are needed to confirm these findings.

## **V. CONCLUSION**

Patient characteristics were consistent with previous studies: mean age  $67.9 \pm 9.3$  years, predominantly  $\geq 50$  years (98.8%) and female (83.3%). Most were overweight (46.6%), engaged in manual labor (82.1%), and had disease duration  $> 1$  year (82.1%). Common symptoms included activity-related pain, limited ROM, morning stiffness, crepitus, and positive Clarke's sign. Most cases were Kellgren - Lawrence grade II (85.7%).

After 15 days, the intervention group showed significantly greater improvement than the control group in VAS (-5.3), ROM (+19.9°), and WOMAC (-33.5) ( $p < 0.05$ ). Traditional medicine symptoms improved in both groups without significant between-group differences. No adverse events were recorded during the study period.

### **Conflict of interest**

The authors declare that they have no conflict of interest.

**REFERENCES**

1. Cui A, Li H, Wang D, Zhong J, Chen Y, Lu H. Global, regional prevalence, incidence and risk factors of knee osteoarthritis in population-based studies. *EClinicalMedicine*. 2020;29-30:100587.
2. Ho-Pham LT, Lai TQ, Mai LD, Doan MC, Pham HN, Nguyen TV. Prevalence of radiographic osteoarthritis of the knee and its relationship to self-reported pain. *PLoS One*. 2014;9(4):e94563.
3. Faculty of Traditional Medicine, Hue University of Medicine and Pharmacy. *Geriatric Pathology Textbook*. Hue: Hue University Publishing House; 2025: 44-60.
4. Schafer M. The acute effects of cupping therapy on hamstring range of motion compared to sham [thesis]. Las Vegas: University of Nevada, Las Vegas; 2018.
5. Altman RD. Criteria for classification of clinical osteoarthritis. *J Rheumatol Suppl*. 1991;27:10-12.
6. Kohn MD, Sasso AA, Fernando ND. Classifications in brief: Kellgren-Lawrence classification of osteoarthritis. *Clin Orthop Relat Res*. 2016;474(8):1886-1893.
7. Clancy CC, Browne LD, Gilligan R, Blake O, Stack AG. Prevalence of anaemia, iron, and vitamin deficiencies in the health system in the Republic of Ireland: a retrospective cohort study. *BJGP Open*. 2024;8(2):BJGPO.2023.0126.
8. Nguyen NVP. Evaluation of the efficacy of electroacupuncture and the herbal formula Du Huo Ji Sheng Tang, combined with herbal compress, in treating wind-cold-damp type knee osteoarthritis [thesis]. Hue: University of Medicine and Pharmacy, Hue University; 2021.
9. Shah HA, Tikoo AK, K S. Cupping therapy for pain management and improving the quality of life in knee osteoarthritis: a case report. *Altern Ther Health Med*. 2025;31(3):57-61.