Original Article

Angiographic Findings after Supplementation with *Heracleum persicum* Extract: Results of a Randomized Controlled Trial

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ABSTRACT

Background: *Heracleum persicum* is a common dietary spice with several traditional medicinal properties important for cardiovascular health including antioxidant, hypolipidemic, and anti-inflammatory effects. This study explored the effects of supplementation with *H. persicum* fruit on the angiographic findings of patients with minimal coronary artery disease (CAD).
Methods: Subjects who were diagnosed with <50% stenosis in any of their coronary arteries by angiography were selected for this trial and randomly assigned to *H. persicum* hydroalcoholic fruit extract (n = 15; 300 mg/day) or placebo (n = 12) for 6 months. At the end of the trial, participants underwent a second coronary angiography in order to evaluate the progression of their disease.
Results: Posttrial angiography did not reveal any improvement in the number of stenosed vessels after consumption of *H. persicum* extract versus placebo (P > 0.05). Similarly, there was no significant difference between the study groups in terms of disease progression and chest pain score (P > 0.05).
Conclusions: The present results do not support any clinically significant benefit of supplementation with *H. persicum* extract on the angiographic findings of in patients with minimal CAD.

Key words: Angiography, *Heracleum persicum*, herbal pharmacotherapy, ischaemic heart disease, randomized controlled trial

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INTRODUCTION

Coronary artery disease (CAD) is the most common type of cardiovascular disease and results in the reduction of cardiac blood flow because of atherosclerotic plaque formation and subsequent arterial narrowing.[1] CAD accounts for a considerable burden of mortality as well as tremendous health care cost.[2] Numerous evidence from epidemiological surveys has shown an inverse association between consumption of diets rich in vegetables and fruits, and the occurrence of CAD and its complications.[3] Plants contain a multitude of bioactive phytochemicals that can synergistically modify several cardiovascular risk factors including inflammation, dyslipidemia, hypertension, insulin resistance, and adiposity.[4-6]

Heracleum persicum (Persian hogweed) is a perennial herb belonging to the family Apiaceae. This plant is endemic to Iran and is known with the vernacular name "Golpar." Fruits of *H. persicum* are commonly consumed in the Persian cuisine as a dietary spice.

H. Persicum fruits are reputed in Iranian traditional medicine for treating various ailments. In addition, modern pharmacological research has unveiled different activities of *H. persicum,* including anti-inflammatory,[7] antioxidant,[8] and lipid-modifying effects.[9] These activities are important for the prevention of atherosclerosis and promotion of cardiovascular health. However, no study has yet evaluated the efficacy of supplementation with *H. persicum* in CAD patients. The present pilot study aimed to investigate this issue in subjects with minimal CAD.

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METHODS

This study was designed as a randomized, double-blind, and placebo-controlled trial. Included subjects were selected from those with symptoms of stable angina pectoris who were referred to the Cardiology Clinic at the Baqiyatallah Hospital (Tehran, Iran) for coronary angiography. Subjects had myocardial ischemia according to the findings of the exercise test, thallium single photon emission computed tomography or dobutamin stress echocardiography. Coronary angiography was performed using routine procedures and angiograms were interpreted offline by a blinded cardiologist.

For this trial, only subjects with minimal CAD (defined as <50% stenosis in any of the coronary arteries) were selected. Candidates of coronary artery bypass grafting and coronary angioplasty, as well as those subjects with >50% reduction of coronary artery diameter, unstable angina, acute coronary syndrome, systemic diseases and malignancies were excluded from the trial. Eligible subjects (n = 27) were randomly allocated to receive *H. persicum* hydroalcoholic extract (n = 15; 300 mg/day) or matching placebo (n = 12) for a period of 6 months. All patients were receiving standard of care treatments for controlling comorbidities such as dyslipidemia and hypertension. At the end of the trial, participants underwent a second coronary angiography in order to evaluate the progression of their disease.

Table 1: Baseline characteristics of the study groups

Group	*Heracleum persicum*	Placebo	*P*
Age (years)	58.3±12.9	54.0±9.3	0.452
Female (%)	33	50	0.449
Weight (kg)	76.6±7.7	80.1±11.9	0.683
Height (m)	167.7±6.6	171.0±7.4	0.427
BMI (kg/m^2)	27.3±2.7	27.4±3.9	0.905
Smoking (%)	25	7	0.294
Dyslipidaemia (%)	33	42	0.706
Hypertension (%)	73	58	0.448
CVD (%)	27	17	0.662
Diseased vessels (%)			
SVD	54	67	0.852
2VD	31	17	
3VD	15	16	
Ejection fraction (%)			
25-50	27	9	0.586
>50	73	91	
Drugs			
β-blockers	73	92	0.342
Calcium blockers	80	92	0.605
Aspirin	87	100	0.487
Nitrates	80	92	0.605
Diuretics	7	42	0.060
Statins	87	100	0.487

BMI: Body mass index, CVD: Cardiovascular disease, SVD: Single vessel disease

RESULTS

The groups were comparable at baseline regarding age, gender, anthropometric parameters, ejection fraction, the number of diseased vessels, history of cardiovascular disease and drug therapy (P > 0.05). Similarly, there was no significant difference in the frequencies of smoking, dyslipidemia and hypertension between the study groups (P > 0.05) [Table 1].

Posttrial angiography did not reveal any improvement in the number of stenosed vessels after consumption of *H. persicum* extract versus placebo, apart from a significant difference in the number of subjects with normal angiographic findings in the left circumflex artery (P < 0.001), and a borderline difference in the number of subjects with normal posterior descending artery (P = 0.070). There was no significant difference between the study groups in terms of disease progression and chest pain score (P > 0.05) [Table 2].

Table 2: Frequency of coronary arteries with normal angiographic finding at baseline and study end

Coronary artery	*Heracleum persicum* (%)		*P*	Placebo (%)		*P*
	Baseline	Study end		Baseline	Study end	
LM	93	60	0.125	100	92	1.00
LAD	53	40	0.625	50	67	0.680
LCX	87	13	0.001	92	83	1.00
RCA	47	20	0.125	67	75	1.00
OM	53	20	0.063	75	83	1.00
PDA	67	27	0.070	83	83	1.00
D1	53	27	0.219	58	67	1.00
Chest pain score	1.46±0.78	1.23±1.36	0.317	1.62±0.99	1.50±1.30	0.06
Disease status						
Progression	55			77		
Stable	27			8		
Regression	18			15		

P=0.588. LM: Left main, LAD: Left anterior descending, LCX: Left circumflex, RCA: Right coronary artery, OM: Obtus marginal, PDA: Posterior descending artery, D1: First diagonal

CONCLUSIONS

The above results do not support any clinically significant benefit of supplementation with *H. persicum* extract in patients with minimal CAD. Previous studies have shown that *H. persicum* is rich in phytochemicals such as flavonoids and furanocoumarins,[10,11] and have been shown to possess anti-atherosclerotic and cardioprotective properties.[12] Furthermore, our previous trial demonstrated the efficacy of *H. persicum* extract as adjunct to low-dose atorvastatin in lowering serum total cholesterol and low-density lipoprotein cholesterol concentrations,[9] but the impact of this plant extract on the formation and progression of atherosclerotic plaques has not yet been reported.

In light of the present results, *H. persicum* extract is unlikely to have any significant plaque-regressing effect because of the futility of this extract in reducing luminal narrowing of coronary arteries. In spite of this negative finding, it must be noted that the present trial investigated the impact of short-term supplementation with *H. persicum* extract and the number studied was small. That long-term consumption of this extract can improve angiographic findings remains open to question, and merits further investigation.

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