

# The use of *Ammi visnaga* in the treatment of prediabetes and weight loss: the antioxidant impacts in diabetes treatment as a new medical hypothesis

## Abstract

**Introduction:** Prediabetes status is considered as an important feature in either controlling the development or progression of diabetes. It may pass unnoticed because the symptoms of diabetes are usually not well established.

**Study objectives:** The main objectives of the present study were to explore the efficacy of using *Ammi visnaga* treating pre-diabetic cases and weight losing.

**Methods and subjects:** A prospective study was conducted to investigate the impact of using *Ammi visnaga* treatment of pre-diabetes and weight control. The study included 5 patients with pre-diabetes (glucose level was  $128 \pm 32$  mg/dl). The age of patients was  $42 \pm 18.5$  years. The study included 3 males and 2 females. In general, patients were overweight according to body mass index level was  $28 \pm 7.8$  kg/m<sup>2</sup>. The patients used the aqueous extract of *Ammi visnaga* for two months (200 ml daily).

**Results:** At the end of the experiment, the glucose level was significantly reduced ( $p < 0.05$ ) to the level of  $88 \pm 12.5$  mg/dl. There was also a significant reduction in the level of BMI from  $28 \pm 7.8$  kg/m<sup>2</sup> to  $22 \pm 6.4$  kg/m<sup>2</sup> ( $p < 0.05$ ).

**Conclusion:** The results of the present study showed that *Ammi visnaga* has the therapeutic potential to control the progression of complete episodes of diabetes by controlling the pre-diabetic status.

**Keywords:** pre-diabetes, glucose, BMI, overweight, *Ammi visnaga*

Volume 10 Issue 6 - 2020

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**Received:** October 11, 2020 | **Published:** November 09, 2020

**Abbreviations:** ADA, American diabetes association; BMI, body mass index

## Introduction

At the worldwide level, the predominance of type 2 diabetes has drastically expanded.<sup>1-3</sup> Examination has demonstrated a huge connection among diabetes and every one of heftiness and insulin obstruction just as adjustments in the capacity of  $\beta$ -cells in the pancreas.<sup>4,5</sup> The subsequent impacts incorporate declining paces of insulin digestion, for example, glucose, lipids, and proteins.<sup>6</sup> Diabetes can bring about regulatory changes in the hemostasis of calcium, phosphorus and magnesium finishing with genuine confusions including cardiovascular sickness and neurological problems.<sup>7,8</sup> As indicated by the American Diabetes Association (ADA), pre-diabetes can be characterized as either impedance of fasting glucose (5.6–6.9 mmol/L) or alteration of oral glucose tolerance test (2-h OGTT glucose 7.8–11.0 mmol/L).<sup>9</sup> Different investigations indicated that the pre-diabetic state is described by a decrease of glucose tolerance and lowered insulin secretion.<sup>10</sup> It has been exhibited that the condition of pre-diabetes is related with creating cardiovascular occasions, for example, myocardial anomalies. Appropriately, as ahead of schedule as the cardiovascular changes have been resolved in this express, the outcomes are ideal in forestalling the advancement of heart illnesses.<sup>11</sup>

## Study objectives

The main objectives of the present study were to explore the therapeutic potential of *Ammi visnaga* treating pre-diabetic cases and lowering weight.

## Methods and subjects

**Study design:** A prospective study was conducted to examine the impact of using *Ammi visnaga* on patients with pre-diabetes. All participants in the present study voluntarily participated, and agreed to use this prescription with weekly monitoring for their glucose levels. No nutritional restrictions were followed.

**Study sample:** Study sample included 5 patients with prediabetes, 2 females and 3 males.

**Study procedure:** Patients were suggested to use the aqueous extract of *Ammi visnaga*, 200 ml/daily for two months. At the beginning and the end of the experiment, in addition to weakly monitoring of glucose levels were taken, the BMI was calculated for each patient.

**Statistical analysis:** The analysis of data was carried out using SPSS version 21. Descriptive statistics were used to describe data. The collected data was presented in terms of means and standard deviation. The relationships between variables was determined based on independent T test. Significance was considered at  $\alpha \leq 0.05$ .

## Results

As demonstrated in Table 1, the mean age of the patients was  $42 \pm 18.5$  years, 60% of patients were males. The mean level of glucose was  $128 \pm 32$  mg/dl. The mean of BMI was  $28 \pm 7.8$  kg/m<sup>2</sup>. As seen in Table 2, there were significant changes in the levels of glucose and BMI. Glucose levels significantly decreased from  $128 \pm 32$  mg/dl to 88 mg/dl ( $p < 0.05$ ). The levels of BMI were significantly decreased ( $p < 0.05$ ) from  $28 \pm 7.8$  to  $22 \pm 6.4$  kg/m<sup>2</sup>.

**Table 1** Study variables in the beginning of the study

Variable	Description
Age (M±SD) years	42±18.5 years
Gender (N, %):	
- Male	3 (60%)
- Female	2 (40%)
Glucose (M±SD) mg/dl	128±32
BMI (M±SD) kg/m <sup>2</sup>	28±7.8 kg/m <sup>2</sup>

**Table 2** The relationships between study variables before and after the experiment

Variable	M	SD	P value
Glucose-before	128	32	<0.05
Glucose-after	88	12.5	
BMI-before	28	7.8	<0.05
BMI-after	22	6.4	

## Discussion

We have previously shown that pre-diabetic conditions can be treated and reversed to physiological level using rat models by the using of *Urtica pillifera*.<sup>12</sup> We also found that pre-diabetes can be reversed by the using of tadalafil 5 mg/daily.<sup>13</sup> The present study showed that another herbal treatment, *Ammi visnaga*, can be used to treat pre-diabetic conditions. We think that it can exert their effects by two mechanisms. The first mechanism is mediated through the antioxidant's effect.<sup>14</sup> The second mechanism is through decreasing lipid levels such as cholesterol and triglycerides as reported in other studies.<sup>15</sup> Using rat model, we previously found that molecular defects in the brain white matter were beyond the events involved in the development of diabetes.<sup>16</sup> We also found similar effects on liver induced by anti-oxidants.<sup>17</sup> The impacts of using *Ammi visnaga* in reducing weight were apparent in significantly lowering the levels of BMI. BMI is a good indicator of health since it determines normal weight, overweight, and obesity.<sup>18</sup>

## Conclusion

The present study demonstrated that pre-diabetes is a very important situation and can be controlled to prevent the development of full episodes of diabetes, and it can be reversed to physiological conditions. *Ammi visnaga* is a herb with therapeutically beneficial effects to control diabetes.

## Study limitations

The study gave a clue to early control diabetes, but the number of participants limited the possibility of generalizing the results. Other limitations included investigating other biochemical tests including lipid profile, liver function tests, and kidney function tests.

## Acknowledgments

None.

## Conflicts of interest

Author declare that there is no conflict of interest.

## Funding

None.

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