

Nigella sativa in Diabetes Mellitus: Bridging Homoeopathic Materia Medica with Modern Metabolic Science

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Abstract

Diabetes mellitus is a chronic metabolic disorder characterised by hyperglycaemia resulting from impaired insulin secretion, insulin resistance, or both. Oxidative stress, inflammation and dyslipidaemia contribute to its progression and complications. *Nigella sativa* L. (black seed) has gained scientific interest for its potential antihyperglycaemic, antioxidant, anti-inflammatory, and hypolipidaemic properties. ^{1,2} Thymoquinone, its principal bioactive constituent, has demonstrated potential effects on glucose metabolism, insulin sensitivity and oxidative stress. ³ Clinical studies suggest that *N. sativa* supplementation may improve fasting blood glucose and glycated haemoglobin (HbA1c), although results remain heterogeneous. ^{4,5} From a homoeopathic perspective, *N. sativa* (Nig-s.) is recognised as a remedy in the homoeopathic materia medica. The present review considers the potential role of *N. sativa* in diabetes while distinguishing pharmacological evidence from evidence concerning homoeopathic preparations.

Keywords: *Nigella sativa*, Nig-s., diabetes mellitus, thymoquinone, HbA1c, insulin resistance, homoeopathy.

Introduction

Type 2 diabetes mellitus is characterised by insulin resistance, progressive β -cell dysfunction and abnormal glucose and lipid metabolism. Persistent hyperglycaemia promotes oxidative stress and inflammatory pathways, contributing to diabetic complications. ¹

Nigella sativa L., belonging to the family Ranunculaceae, contains several bioactive constituents, particularly thymoquinone, thymohydroquinone, thymol and carvacrol. Thymoquinone has received considerable attention because of its antioxidant, anti-inflammatory and metabolic activities. ^{2,3}

Homoeopathic Perspective

In homoeopathy, *Nigella sativa* is known as Nig-s and is considered based on its characteristic symptomatology and the principle of similars. Its homoeopathic materia-medica profile provides a separate basis for investigating the remedy. However, pharmacological studies of crude seeds, oils or extracts cannot be directly equated with evidence for homoeopathic potencies.

This distinction is essential in scientific research: crude-drug pharmacology and homoeopathic potentised preparations represent different research questions and require separate clinical evaluation.

Potential Antidiabetic Mechanisms

The proposed metabolic effects of *N. sativa* are multifactorial. Experimental evidence suggests possible improvement in insulin sensitivity and glucose utilisation, together with modulation of hepatic glucose metabolism.³

Thymoquinone may also protect pancreatic β -cells against oxidative injury and influence antioxidant defence mechanisms. Its antioxidant activity may involve modulation of endogenous systems such as superoxide dismutase, catalase and glutathione-related pathways.³

In addition, the anti-inflammatory properties of *N. sativa* may be relevant because chronic low-grade inflammation contributes to insulin resistance and metabolic dysfunction.²

Effects on Glycaemic Control

Clinical trials have investigated *N. sativa* for fasting blood glucose, postprandial glucose and HbA1c. A systematic review and meta-analysis of randomised controlled trials reported reductions in fasting plasma glucose, postprandial glucose and HbA1c following *N. sativa* supplementation.⁴

An updated meta-analysis also reported significant reductions in fasting blood glucose and HbA1c, although considerable heterogeneity was observed among the included trials.⁵ These differences may relate to variations in preparation, dosage, duration and participant characteristics.

Effects on Lipid Profile

N. sativa has also been investigated for its effects on diabetes-associated dyslipidaemia. Meta-analytic evidence suggests potential reductions in total cholesterol and LDL cholesterol, although effects on triglycerides and HDL cholesterol have been less consistent.⁶

The combination of possible glycaemic and lipid-modifying effects makes *N. sativa* a relevant subject for further metabolic research.

Evidence and Limitations

Preclinical studies support potential antihyperglycaemic and cytoprotective effects of *N. sativa* and thymoquinone, while human studies provide preliminary evidence of improvements in selected metabolic parameters.^{2,3} However, clinical evidence remains limited by small sample sizes, variation in preparations and doses, short intervention periods and methodological heterogeneity.⁵

Importantly, most modern clinical research evaluates measurable quantities of *N. sativa* seed, oil or extract. These findings should not be interpreted as direct evidence for the efficacy of homoeopathic potencies. Dedicated randomised, double-blind, placebo-controlled studies of defined homoeopathic preparations are required to evaluate that question.

Conclusion

Nigella sativa represents an interesting bridge between traditional medicinal knowledge, homoeopathic materia medica and modern phytopharmacological research. Experimental and clinical evidence suggests potential antihyperglycaemic, antioxidant, anti-inflammatory and lipid-modulating effects, particularly in preparations containing measurable *N. sativa* constituents.^{3–6}

From a homoeopathic perspective, further research should independently evaluate *Nigella sativa* potencies using rigorous clinical methodology and predefined metabolic outcomes. Until such evidence

is available, *N. sativa* should be regarded as a potential complementary research area rather than an established replacement for conventional diabetes treatment.

References

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