Online Submissions: wjg.wjgnet.com
wjg@wjgnet.com
doi:10.3748/wjg.15.2170

World J Gastroenterol 2009 May 7; 15(17): 2170-2171
World Journal of Gastroenterology ISSN 1007-9327

LETTERS TO THE EDITOR

Emerging clinical and therapeutic applications of *Nigella sativa* in gastroenterology

Shailendra Kapoor

Shailendra Kapoor, Kristin 24, Schaumburg, IL 60195, United States
Author contributions: Kapoor S wrote the entire manuscript.
Correspondence to: Shailendra Kapoor, MD, Kristin 24, Schaumburg, IL 60195, United States. shailendrakapoor@yahoo.com
Telephone: +1-847-8866789 Fax: +1-847-8979878
Received: December 30, 2008 Revised: February 11, 2009
Accepted: February 18, 2009
Published online: May 7, 2009

Abstract

Nigella sativa (*N. sativa*) decreases DNA damage and thereby prevents initiation of carcinogenesis in colonic tissue secondary to exposure to toxic agents such as azoxymethane. *N. sativa* is of immense therapeutic benefit in diabetic individuals and those with glucose intolerance as it accentuates glucose-induced secretion of insulin besides having a negative impact on glucose absorption from the intestinal mucosa. *N. sativa* administration protects hepatic tissue from deleterious effects of toxic metals such as lead, and attenuates hepatic lipid peroxidation following exposure to chemicals such as carbon tetrachloride.

Key words: *Nigella sativa*; Thymoquinone; Colon cancer; Glutathione-S transferase; Schistosomiasis

Peer reviewer: Valentin Fuhrmann, MD, Department of Internal Medicine 4, Intensive Care Unit, Medical University Vienna, Waehringer Guertel 18-20, A-1090 Vienna, Austria

Kapoor S. Emerging clinical and therapeutic applications of *Nigella sativa* in gastroenterology. *World J Gastroenterol* 2009; 15(17): 2170-2171 Available from: URL: http://www.wjgnet.com/1007-9327/15/2170.asp DOI: http://dx.doi.org/10.3748/wjg.15.2170

TO THE EDITOR

Yildiz *et al*[1] in their recent article, published in the September issue of the "*World Journal of Gastroenterology*", have clearly highlighted the efficacy of *Nigella sativa* (*N. sativa*) in relieving the deleterious effects of ischemia reperfusion injury in the liver. Their findings bring into highlight the increasing clinical and therapeutic applications of *N. sativa* and its derivatives in the field of gastroenterology.

N. sativa decreases DNA damage and thereby prevents initiation of carcinogenesis in colonic tissue secondary to exposure to toxic agents such as azoxymethane[2]. In fact, sustained delivery of thymoquinone (derived from *N. sativa*) is almost as effective in causing apoptosis of colon cancer cells as sustained delivery of 5-fluorouracil[3]. Similarly, hepatic metastasis from tumors such as mastocytomas is markedly decreased following administration of *N. sativa*[4]. *N. sativa*, when used in combination with *Hemidesmus indicus* and *Smilax glabra*, also seems to decrease hepatic carcinogenesis secondary to exposure to agents such as diethylnitrosamine[5]. These anti-carcinogenic effects are mediated in part by thymoquinone secondary to its inhibitory influence on the NF-κB activation pathway[6].

N. sativa is of great therapeutic benefit in diabetic individuals and those with glucose intolerance, as it accentuates glucose-induced secretion of insulin, besides having a negative impact on glucose absorption from the intestinal mucosa[7,8]. In fact, *N. sativa* attenuates the damage to β-cells of the pancreas following exposure to toxic elements such as cadmium[9]. Similarly, *N. sativa* administration attenuates the ulcerative effects of ethanol on gastric mucosa by decreasing the glutathione-S transferase levels in gastric mucosa[10].

Besides these effects, *N. sativa* also demonstrates anti-parasitic effects. For instance, its administration decreases the number of eggs as well as worms in schistosomiasis, which tends to affect hepatic and intestinal tissues[11]. In addition, *N. sativa* attenuates the side effects associated with some common medications used by gastroenterologists. For instance, cyclosporine, used by gastroenterologists for disorders such as recalcitrant Crohn's disease, is often associated with nephrotoxic side effects, which can be limited by *N. sativa* due to its anti-oxidant properties[12]. Similarly, *N. sativa* administration protects hepatic tissue from deleterious effects of toxic metals such as lead and attenuates hepatic lipid peroxidation following exposure to chemicals such as carbon tetrachloride[13,14].

Thymoquinone, derived from *N. sativa*, has also been demonstrated to induce apoptosis of human colon cancer cells[15]. The above examples clearly illustrate the massive clinical and therapeutic potential of *N. sativa*.

Personally, I believe that the anti-carcinogenic effects of *N. sativa* hold the maximum therapeutic potential. Given the significant benefits associated with its administration, broad-spectrum studies are clearly and urgently needed to further assess and elaborate its therapeutic benefits in gastroenterology.

REFERENCES

1 **Yildiz F**, Coban S, Terzi A, Ates M, Aksoy N, Cakir H, Ocak AR, Bitiren M. Nigella sativa relieves the deleterious effects of ischemia reperfusion injury on liver. *World J Gastroenterol* 2008; **14**: 5204-5209

2 **Al-Johar D**, Shinwari N, Arif J, Al-Sanea N, Jabbar AA, El-Sayed R, Mashhour A, Billedo G, El-Doush I, Al-Saleh I. Role of Nigella sativa and a number of its antioxidant constituents towards azoxymethane-induced genotoxic effects and colon cancer in rats. *Phytother Res* 2008; **22**: 1311-1323

3 **Norwood AA**, Tucci M, Benghuzzi H. A comparison of 5-fluorouracil and natural chemotherapeutic agents, EGCG and thymoquinone, delivered by sustained drug delivery on colon cancer cells. *Biomed Sci Instrum* 2007; **43**: 272-277

4 **Ait Mbarek L**, Ait Mouse H, Elabbadi N, Bensalah M, Gamouh A, Aboufatima R, Benharref A, Chait A, Kamal M, Dalal A, Zyad A. Anti-tumor properties of blackseed (Nigella sativa L.) extracts. *Braz J Med Biol Res* 2007; **40**: 839-847

5 **Iddamaldeniya SS**, Thabrew MI, Wickramasinghe SM, Ratnatunge N, Thammitiyagodage MG. A long-term investigation of the anti-hepatocarcinogenic potential of an indigenous medicine comprised of Nigella sativa, Hemidesmus indicus and Smilax glabra. *J Carcinog* 2006; **5**: 11

6 **Sethi G**, Ahn KS, Aggarwal BB. Targeting nuclear factor-kappa B activation pathway by thymoquinone: role in suppression of antiapoptotic gene products and enhancement of apoptosis. *Mol Cancer Res* 2008; **6**: 1059-1070

7 **Rchid H**, Chevassus H, Nmila R, Guiral C, Petit P, Chokaïri M, Sauvaire Y. Nigella sativa seed extracts enhance glucose-induced insulin release from rat-isolated Langerhans islets. *Fundam Clin Pharmacol* 2004; **18**: 525-529

8 **Meddah B**, Ducroc R, El Abbes Faouzi M, Eto B, Mahraoui L, Benhaddou-Andaloussi A, Martineau LC, Cherrah Y, Haddad PS. Nigella sativa inhibits intestinal glucose absorption and improves glucose tolerance in rats. *J Ethnopharmacol* 2009; **121**: 419-424

9 **Demir H**, Kanter M, Coskun O, Uz YH, Koc A, Yildiz A. Effect of black cumin (Nigella sativa) on heart rate, some hematological values, and pancreatic beta-cell damage in cadmium-treated rats. *Biol Trace Elem Res* 2006; **110**: 151-162

10 **Kanter M**, Demir H, Karakaya C, Ozbek H. Gastroprotective activity of Nigella sativa L oil and its constituent, thymoquinone against acute alcohol-induced gastric mucosal injury in rats. *World J Gastroenterol* 2005; **11**: 6662-6666

11 **El Shenawy NS**, Soliman MF, Reyad SI. The effect of antioxidant properties of aqueous garlic extract and Nigella sativa as anti-schistosomiasis agents in mice. *Rev Inst Med Trop Sao Paulo* 2008; **50**: 29-36

12 **Uz E**, Bayrak O, Uz E, Kaya A, Bayrak R, Uz B, Turgut FH, Bavbek N, Kanbay M, Akcay A. Nigella sativa oil for prevention of chronic cyclosporine nephrotoxicity: an experimental model. *Am J Nephrol* 2008; **28**: 517-522

13 **Farrag AR**, Mahdy KA, Abdel Rahman GH, Osfor MM. Protective effect of Nigella sativa seeds against lead-induced hepatorenal damage in male rats. *Pak J Biol Sci* 2007; **10**: 2809-2816

14 **Kanter M**, Coskun O, Budancamanak M. Hepatoprotective effects of Nigella sativa L and Urtica dioica L on lipid peroxidation, antioxidant enzyme systems and liver enzymes in carbon tetrachloride-treated rats. *World J Gastroenterol* 2005; **11**: 6684-6688

15 **Gali-Muhtasib H**, Diab-Assaf M, Boltze C, Al-Hmaira J, Hartig R, Roessner A, Schneider-Stock R. Thymoquinone extracted from black seed triggers apoptotic cell death in human colorectal cancer cells via a p53-dependent mechanism. *Int J Oncol* 2004; **25**: 857-866

S- Editor Cheng JX **L- Editor** Wang XL **E- Editor** Zheng XM