North American Ginseng

Mel Borins, MD, CCFP, FCFP

In North America, ginseng has grown commercially, mainly in the Canadian provinces of British Columbia and Ontario. Wisconsin is the largest producer of North American ginseng (NAG) in the US. The products are usually standardized to their ginsenoside (or panaxoside) content. Generally, the active ingredient is extracted from the root of the plant, but the berries and leaf also contain active ginsenosides. Other names for NAG include :

- Anchi ginseng,
- Canadian ginseng,
- Ontario ginseng,
- *P. quincefolium*,
- red berry,
- ren shen,
- sang,
- Tienchi ginseng and
- Wisconsin ginseng.

There are three main types of ginseng widely available in Canada. These are *Panax ginseng* (Asian ginseng), *Panax quinquefolius* (Canadian/American ginseng) the best studied in diabetes and *Eleutherococcus senticosus* (Siberian ginseng. This is a different plant).

In the December 2000 issue of the journal *Public Health Nutrition*, Kitts and Hu summarized the following research in their article "Efficacy and Safety of Ginseng":[1]

- There probably are differences in pharmacological properties between different species of ginseng. Traditionally, in the ancient Asian concept of the complementary forces of ying and yang, NAG provides the ying, or the cooling effect to offset stress, while Panax ginseng provides warmth, or the yang conditions to counter-balance stress. These apparent differences in the cause-and-effect properties of ginseng may be related to the different composition of ginsenosides present in these two sources of ginseng.
- The effects of NAG on the metabolism, the endocrine system, immunity, cancer and on the cardiovascular system are listed in Table 1.

Table 1

The different effects of American ginseng

Metabolic effects

The metabolic effects for Panax spp. may include:
- Enhanced oxygen uptake and cellular glucose uptake
- No effect on cholesterol levels
- Activation of DNS polymerase
- Stimulatory effect on brain neuronal activity
- Lowering of blood glucose (especially *Panax qinquefolius*)
- No ergogenic effects

Endocrine effects

The endocrine effects for Panax spp. may include:
- Enhanced adrenocorticotrophin secretion
- Increased plasma cortisone
- Reduced ACh-evoked catecholamine release

Immune system effects

The immune system effects for Panax spp. may include:
- Enhanced function of peripheral blood mononuclear cells in immune compromised patients
- Increase in T-helper cells
- T-cell and macrophage cytokine induction
- Reduction of leukotriene release
- Immunostimulatory activity in the elderly

Anti-cancer effects

The potential anti-cancer effects for Panax spp. may include:
- Anti-neoplastic immunostimulatory activity
- Specific anti-mutagenic and anti-tumour activity
- Protection from radiation-induced DNA damage

Cardiovascular effects

Cardiovascular effects for Panax spp. may potentially include:
- Enhanced recovery of brain ischemia injury
- Inhibition of platelet aggregation

Taken and adapted from Kitts and Hu: Efficacy and safety of ginseng. Public Health Nutri 2000; 3(4A):473-85.

NAG's effect on diabetes

Reported mechanisms of the action of NAG on diabetes includes:

- Decreased rate of carbohydrate absorption into the portal hepatic circulation
- Increased glucose transport and uptake mediated by nitric oxide

- Increased glycogen storage
- Modulation of insulin secretion

Type 2 diabetes mellitus[2]

In a double-blind, controlled Canadian trial, 10 healthy patients and 10 with Type 2 diabetes mellitus were given 3 g of ginseng, q.d., either 40 minutes before or together with a 25 g oral glucose challenge. In patients with diabetes, a significant reduction was noted (19% to 22%) in their post-prandial glycemic levels vs. those who took placebo, regardless of when ginseng was taken. The healthy individuals only showed effects if and when ginseng was ingested 40 minutes pre-glucose challenge.

A second study at the same institution found that non-diabetics who took 3 gm, 6 gm or 9 gm of NAG had improved glucose tolerance when ginseng was taken 40 minutes, 80 minutes or 120 minutes before a glucose challenge.[3]

A third study examined 10 Type 2 diabetic patients who were randomly given either placebo or 3 g, 6 g, or 9 g of ground NAG root in capsules at 120 minutes, 80 minutes, 40 minutes, or immediately before a 25 g oral glucose challenge. Capillary blood glucose was measured before ingestion of the intake of NAG or placebo and immediately after, at 15 minutes, 30 minutes, 45 minutes, 60 minutes, 90 minutes and at 120 minutes from the start of the glucose challenge. The conclusion was that it was the dose of the NAG and not the time of administration before the challenge, that significantly reduced post-prandial glucose.[4]

Cold FX[5]

In a US randomized, controlled trial investigating remedies for common colds, 328 individuals aged 18 years to 65 years were given an extract of NAG (known as Cold FX) or placebo, b.i.d., for four months. Those who took NAG noted reductions in all of the following:

- Mean number of colds per person
- Proportion of people that had two or more colds
- Severity of symptoms
- Number of days cold symptoms were reported

Side-effects of ginseng species

Few side-effects and drug interactions have been documented with NAG. The following have been reported to occur with high doses of different species of ginseng:

- hypertension,
- GI disturbances,
- insomnia,
- depression and
- confusion and nervousness.

However, long-term use (12 weeks) of 3 gm of NAG seems to have no effect on 24-hour BP and renal function in hypertensive individuals. Ginseng/drug interactions have been observed with phenelzine, a monoamine oxidase inhibitor. Ginseng may reduce the effect of warfarin. There have been isolated reports in the literature suggesting that various ginseng products may have estrogen-like effects, prolong the QT interval, decrease white blood cells, have manic effects and increase bleeding. Traditional healers and Traditional Chinese Medicine practitioners tend to use ginseng in combination with other herbs, making its exact impact hard to measure.

Safety in pregnancy and lactation has not been established.

Dosage

In a survey of 50 commercial ginseng preparations from 11 different countries, > 90% of the preparations varied between 2% and 9% in total ginsenoside content and some preparations contained no ginsenosides. One hundred mg to 200 mg of a standardized ginseng extract (4% ginsenosides) taken by mouth q.d., or b.i.d., has been used in studies for up to 12 weeks. Dry ginseng root (0.5 g to 2 g) ingested by mouth q.d., in divided doses, has also been used. Dx

References

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Dr. Borins is an Associate Professor, Faculty of Medicine, University of Toronto and a Staff Member, St. Joseph's Health Centre, Toronto, Ontario. **www.melborins.com**.