Korean Ginseng

Panax ginseng

Common names

Red ginseng, white ginseng, ren shen

Family

Arialiaceae (aralia/ivy)

Part used

Roots

Background and traditional uses

Korean ginseng is a smooth, perennial herb with very fleshy, slow-growing roots around 4-10 inches in length, producing small red fruits in autumn. The roots shape often resembles that of a human body, which influenced it's naming: '*jin-chen*', meaning 'like a man' in Chinese. Interestingly, the Native American name for its local ginseng species (*Panax quinquefolius*) is '*garantoquen*' which holds the same meaning.[1] The word '*panax*' derives from the ancient Greek '*panacea*', meaning cure-all.[2]

The herb grows in the rich forests of Asia and has been utilised by traditional Chinese medicine (TCM) systems for as long as 5,000 years. It is traditionally prescribed for reinforcing qi, nourishing the spleen and lungs and for relieving the symptoms of thirst due to the impairment of body fluids and internal heat.[3] Korean ginseng has also been used traditionally to treat liver diseases, impotence, gastrointestinal disorders, coughs, fevers, tuberculosis, rheumatism, pregnancy related vomiting, hypothermia, dyspnoea and nervous disorders.[4]

Actions

Primary:[2-4]

- Adaptogen
- Anti-inflammatory
- Immunomodulator
- Cognitive enhancer
- Neuroprotective
- Tonic

Secondary:[2-4]

- Antioxidant
- Antiulcer
- Cardiotonic
- Hepatorestorative
- Non-insulin-dependant diabetes (NIDD) adjunct therapy – blood sugar regulator

Applications and indications

- To improve endothelial function.[5]
- To improve blood glucose metabolism in people with or without diabetes.[6-8]
- To improve cognitive function.[6,9]
- Neuroprotection.[10]
- To improve erection quality.[11,12]
- To reduce generalised fatigue and improve wellbeing.[13]

Active constituents and pharmacodynamics

Korean ginseng is rich in saponins, polysaccharides, amino acids and volatile oils.[14] Over 200 phytochemical have been identified in this herb thus far, but the ginsenosides (i.e. dammarane and oleanene saponins),[15] are considered the most characteristic and biologically active compounds in the herb. Some ginsenosides are produced as artefacts through the steaming of Korean ginseng, a traditional step in the preparation of the plants roots. Other ginsenosides will dominate raw preparations of the herb.[2] Traditionally, Korean ginseng is processed in a number of different ways, each of which yield a different spectrum and ratio of ginsenoside types.

Ginsenosides are classified into three classes:

1. Protopanaxatriol (the predominant class) including Rg1, Rg2, Rf and Re
2. Protopanaxadiol, including Rc, Rd, Rb1, Rb2
3. Ocotillol (a largely medicinally inconsequential class).[16]

Summary of clinical evidence

Endothelial function

In a double-blind, randomised, placebo-controlled, cross-over trial, 16 healthy participants were given four different preparations on four occasions, separated by at least three days: 3g Korean ginseng root, a ginsenoside extract from Korean ginseng, a polysaccharide extract from Korean ginseng and a cornstarch control. A brachial blood pressure measurement and a flow-mediated vasodilation (FMD) were performed at baseline and then at 90 and 180 minutes post-treatment. While the brachial blood pressure measurements remained unchanged in all subjects following all treatments, the Korean ginseng root and ginsenosides extract treatments resulted in significantly improved FMD, with maximal vasodilation being seen in the 180-minute measurement. Since the polysaccharide extract and cornstarch did not yield significant results, the research team suggested that ginsenosides are largely responsible for Korean ginseng's endothelial function improvement ability.[5]

Blood glucose

In a double-blind, placebo controlled trial on 27 healthy, overnight fasted subjects, single 200mg or 400mg doses of Korean ginseng, standardised to 4% ginsenosides, followed by a glucose drink significantly decreased blood glucose levels within one to two hours of ingestion when compared to placebo.[6]

In a double-blind, randomised, placebo-controlled trial, 13 healthy and overnight fasted subjects received either 3g of Korean ginseng body, rootlets or placebo on three separate visits.

The treatments were taken 60 minutes prior to a standard test meal with capillary blood samples being taken 60 minutes prior to treatment, at baseline, and then at 15, 30, 45, 60, 90 and 120 minutes following. While the rootlet treatments did not significantly impact postprandial glucose (PPG) levels, the Korean ginseng body treatments lowered PPG from the 45-minute post treatment measurement onwards, resulting in a total reduction averaging 27%. Of further note, the Korean ginseng rootlet treatment was tested to have more than six times the levels of ginsenosides compared to the Korean ginseng body treatment but did not yield the same results, suggesting that ginsenosides may not be solely responsible for the blood glucose reducing effects of Korean ginseng.[7]

In an eight-week, double-blind trial on 36 non-insulin-dependent diabetes mellitus (NIDDM) patients, daily treatment with 100mg or 200mg Korean ginseng resulted in significantly reduced fasting blood sugar (FBG) and improved glycated haemoglobin, serum N-Terminal propeptide of type III collagen (PIIINP) and physical activity when compared to placebo. Both the study group and control group showed reduced body weight and altered serum lipid profiles at the end of the trial, but the placebo had no effect on FBG.[8]

Cognition

A double-blind, placebo-controlled, crossover study had 30 healthy participants complete a 10-minute cognitive task followed by the administration of a 200mg or 400mg standardised Korean ginseng preparation (extract G115, standardised to 4mg total ginsenosides) or placebo for eight days, with a minimum six-day washout period. The cognitive task was repeated at one, 2.5 and four hours post-dose. Improvements in scores in the study group were significant compared to placebo after a single dose, and a general trend of improved wellbeing and calmness was observed in the group.[9]

In another study, both 200mg and 400mg of Korean ginseng (standardised at 4% ginsenosides) showed significant improvements in cognitive function as assessed by a serial sevens subtraction task.[6]

Neuroprotection

In an animal study examining Parkinson's disease pathogenesis, oral administration of an extract of Korean ginseng (G115 - standardised to 4mg ginsenosides) significantly reduced dopaminergic cell loss, microgliosis, and accumulation of a-synuclein aggregates.[10] This study suggests that Korean ginseng may be neuroprotective for conditions that present with similar symptoms.

Erectile function

In a double-blind, placebo-controlled trial on 143 otherwise healthy men with erectile dysfunction (ED), 1g of Korean ginseng extract was administered once or twice daily for eight weeks. The study group experienced significant improvements in erection quality at both doses compared to placebo, as assessed by a Korean version of the international index of erectile function (IIEF) survey.[11]

In a 12-week double-blind, placebo-controlled trial on 60 participants taking 1g Korean ginseng three times daily or placebo, the study group showed significantly improved penile performance as compared to the placebo group. Korean ginseng did not influence testosterone or lipoprotein markers.[12]

Fatigue

In a four-week double-blind, placebo-controlled trial, 90 participants with idiopathic chronic fatigue (ICF) were administered either 1g or 2g of a 20% ethanol extract of Korean ginseng or placebo. The study groups showed significant improvements in a mental self-rating numeric scale compared to the control group. Of note, there was no significant benefits in the 2g group compared to the 1g group. Korean ginseng also reduced visual analogue fatigue scores, lowered reactive oxygen species and malondialdehyde and increased serum glutathione in the study groups.[13]

Dosage summary

Liquid extract (1:1): 7-40mL weekly[17]

Safety information

Korean ginseng may:

- falsely elevate assays for blood digoxin[18]
- increase the effect of hypoglycaemic drugs[18]
- increase the side effects of phenelzine or other MAOIs[18]
- increase or decrease anticoagulant/antiplatelet effects[18]
- increase the stimulating effects of drugs such as caffeine and amphetamines.[19]

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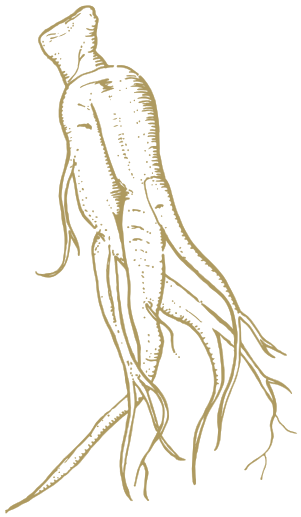

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