



Astragalus

Health Care Professional Information

Scientific Name

Astragalus membranaceus

Common Name

Huang chi, huang qi, milk vetch, *Radix astragali*

Clinical Summary

Astragalus root is widely used in Traditional Chinese medicine for its tonifying properties. Studies done in China suggest that astragalus, when used with angelica, has reno protective effects (6). In addition, astragalus decreases the proteinuria associated with idiopathic membranous nephropathy (7) and exhibits natriuretic action (8). Astragalus may also suppress airway hyper reactivity associated with allergic asthma in vivo (9). It also increases M-cholinergic receptor density in senile rats (11), which suggests that it may have a role in combating senility. Astragalus extract acts as a nerve-growth promoting factor in vitro and in vivo (17), and alleviates obstructive uropathy in mice in combination *Angelica sinensis* and standard care (18).

An herbal formula containing astragalus as a major ingredient has been shown to reduce fatigue in athletes (10).

Astragalus extracts inhibit tumor growth (5), delay chemical-induced hepatocarcinogenesis in rats (4), and have antiangiogenic property (19). In vitro, animal, and anecdotal human data show that astragalus reduces immune suppression, a side effect of chemotherapy (1) (2), and may also enhance the effects of platinum-based chemotherapy (3).

Conclusions from a meta-analysis suggest benefits of astragalus-based treatments for hepatocellular cancers, but data need to be evaluated in larger, well designed trials (16).

Improvement in quality of life was reported following use of an injectable form of astragalus with vinorelbine and cisplatin in patients with advanced non-small cell lung cancer (NSCLC) (20). However, it is not known whether orally administered astragalus will exert the same effect.

Patients taking immunosuppressants (e.g., tacrolimus or cyclosporin) should not take this supplement.

Purported Uses

- Cardiovascular disease
- Chemotherapy side effects
- Common cold
- Diabetes
- HIV and AIDS
- Immunostimulation
- Microbial infection
- Strength and stamina

Constituents

- Triperpenoid saponins (cycloastragenol, astragaloside I to VIII, and cyclocanthoside)
- Cycloartane triterpene
- Polysaccharide
- Isoflavonoids
- Amino acids

(12)

Mechanism of Action

Astragalus works by stimulating several factors of the immune system. The polysaccharides potentiate the immune-mediated antitumor activity of interleukin-2 in vitro ⁽¹³⁾, improve the responses of lymphocytes from normal subjects and cancer patients, enhance the natural killer (NK) cell activity of normal subjects, and potentiate the activity of monocytes ⁽¹⁴⁾, increasing phagocytosis perhaps by regulating tumor necrosis factor (TNF) production ⁽⁵⁾. The saponins potentiate NK cell activity and restore steroid-inhibited NK cell activity in vitro. They also increase phagocytosis and demonstrate hepatoprotective effects on chemically-induced liver injury in vitro ⁽⁶⁾ and in vivo ⁽⁴⁾. Chinese studies suggest that astragalus, when used with angelica, has renal protective effects by mediating gene expression. Astragaloside IV, a saponin constituent, increases tissue-type plasminogen activator (t-PA) synthesis and downregulates the expression of plasminogen activator inhibitor type 1 (PAI-1) ⁽²¹⁾. Astragalus increases M-cholinergic receptor density in senile rats, suggesting that astragalus may have a role in combating brain senility ⁽¹¹⁾. An herbal formula containing astragalus can reduce fatigue in athletes by increasing uptake and utility of oxygen ⁽¹⁰⁾.

Adverse Reactions

Adverse effects have not been reported.

Herb-Drug Interactions

- **Immunosuppressants:** Astragalus may antagonize the effects of immunosuppressants such as tacrolimus and cyclosporine.
- **Aldesleukin:** Concomitant treatment with astragalus has resulted in a 10-fold potentiation of tumor-cidal activity with decreased side effects.
- **Cyclophosphamide:** Astragalus may decrease immunosuppression following treatment. ^{(1) (14) (15)}

Literature Summary and Critique

Most of the clinical trials on astragalus were conducted in China using multiple-herbal formulas that contain astragalus as the major component. The selection of herbs is based on Traditional Chinese Medicine.

[Wu P, Dugoua JJ, Eyawo O, Mills EJ. Traditional Chinese Medicines in the treatment of hepatocellular cancers: a systematic review and meta-analysis. *J Exp Clin Cancer Res.* 2009 Aug 12;28:112.](#)

This analysis included 45 randomized controlled trials of oral TCM preparations for hepatocellular cancers and involved 3,236 patients. Survival, tumor response, and performance scores were examined. The authors report that products containing ginseng, astragalus and mylabris had a larger treatment effect (OR 1.34, 95% CI, 1.04-1.71, P = 0.01) than the pooled broad estimate. They observed a similar pattern for astragalus-based treatments (OR 1.35, 95% CI, 1.001-1.80. P = 0.048).

Astragalus and other TCM products may be effective against hepatocellular cancers. However, the methodology of trials was poor; all the studies were conducted in China and publication bias in favor of only positive reports is likely. The results should be evaluated in well designed trials.

[Guo L, Bai SP, Zhao L, Wang XH. Astragalus polysaccharide injection integrated with vinorelbine and cisplatin for patients with advanced non-small cell lung cancer: effects on quality of life and survival. *Med Oncol.* 2011 Sep 18. \[Epub ahead of print\]](#)

This study included 136 patients with confirmed non-small-cell lung cancer (NSCLS). Patients were randomized to receive vinorelbine and cisplatin (VC) or VC combined with astragalus polysaccharide APS (VC-APS). Following 3 cycles of treatment, significant differences were observed in overall quality of life (P = 0.003), physical function (P = 0.01), fatigue (P < 0.001), nausea and vomiting (P < 0.001), pain (P = 0.007), and loss of appetite (P = 0.023) between the two groups. Median survival time was 10.7 and 10.2 months (P = 0.76) in VC-APS arm and VC arm, with 1-year survival rates of 35.3 and 32.4% (P = 0.717), respectively.

Astragalus polysaccharide injection combined with vinorelbine and cisplatin may help improve quality of life in patients with NSCLC. However, there was no significant improvement in tumor response or survival rates.

[McCulloch M, et al. Astragalus-based Chinese herbs and platinum-based chemotherapy for advanced non-small-cell lung](#)

cancer: [Meta-analysis of randomized trials. *J Clin Oncol* 2006;24\(3\):419-430.](#)

This analysis sought to determine whether Chinese herbal medicine containing Astragalus increases the effectiveness of platinum-based chemotherapy for advanced non-small-cell lung cancer. Thirty-four randomized studies involving 2,815 patients were analyzed. Results suggest that when used in conjunction with platinum-based chemotherapy, Astragalus-based medicine improved survival, tumor response, performance status, and reduced chemotherapy toxicity when compared with chemotherapy alone.

However, the low quality of the studies analyzed is a drawback and the results are therefore, not conclusive. Well-designed studies are warranted.

[Taixiang W, et al. Chinese medical herbs for chemotherapy side effects in colorectal cancer patients \(Review\). *The Cochrane Database Syst Rev* 2005; \(1\):CD004540.](#)

Four clinical trials were included in this review to assess the effectiveness of Astragalus (Huangqi) compounds on the quality of life, side effects of chemotherapy, and on adverse effects in colorectal cancer patients. A decoction of Huangqi compounds was used in combination with chemotherapy in three studies, whereas the fourth study compared Huangqi compounds with two other Chinese herbal formulas. Patients who were given Huangqi compounds experienced a reduction in nausea and vomiting along with a decrease in the rate of leucopenia and an increase in CD3, CD4 and CD8 subsets of T-lymphocytes when compared to those treated with chemotherapy alone in the three studies or with other Chinese formulas in the fourth study.

Use of Chinese herbal medicine along with chemotherapy appears promising for patients with colorectal cancer; however, a major limitation of this review is that it includes only four studies and the studies are of poor quality. Further properly designed trials are needed to confirm these observations.

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Consumer Information

How It Works

Bottom Line: Astragalus has immunostimulant effects, but it has not been shown to treat or prevent cancer.

From the research that has been conducted on astragalus, scientists believe that it works by stimulating several factors of the immune system. In laboratory studies, astragalus extracts augment the activity of monocytes, natural killer cells, and lymphocytes, even when their activity is suppressed by substances such as steroids. In addition, astragalus reversed immune suppression from cyclophosphamide (a common chemotherapy drug) in rats.

Astragalus extracts also protect liver cells from chemical injury in animals and in laboratory studies. Studies conducted in China suggest that astragalus may also protect the kidneys when used in combination with the herb angelica. In studies using senile rats, astragalus increased the ability of their brain cells to respond to stimuli, but it is still unknown if these effects occur in humans. An herbal formula containing astragalus has been shown to reduce fatigue in athletes by increasing uptake and use of oxygen.

Purported Uses

- **To stimulate the immune system**

Laboratory studies and some clinical trials suggest that astragalus stimulates certain parts of the immune system.

- **To reduce the severity of chemotherapy side effects, including immune suppression**

Studies in animals show that astragalus reverses the immune suppression caused by cyclophosphamide and stimulates certain parts of the immune system. Astragalus may reduce the side effects of chemotherapy in colorectal cancer patients. However, more studies are needed to confirm this effect.

- **To fight bacterial infections**

No scientific evidence supports this use.

- **To prevent and treat heart disease**

No scientific evidence supports this use.

- **To treat HIV and AIDS**

Scientific evidence to support this use is lacking.

- **To treat the common cold**

Although laboratory studies and one clinical trial suggest that astragalus stimulates certain parts of the immune system, there is no proof from clinical trials that astragalus can treat the common cold.

- **To treat diabetes**

No scientific evidence supports this use.

Research Evidence

Cancer treatment

This analysis was done to find out if oral Traditional Chinese Medicine formulas are effective in treating hepatocellular cancers. Forty-five randomized clinical trials involving 3,236 patients were included in the analysis. Researchers found that products containing ginseng, astragalus, mylabris and astragalus-based treatments had positive effects in patients with hepatocellular cancers.

One hundred thirty-six patients with non-small-cell lung cancer were randomized in this trial to receive vinorelbine and cisplatin (VC) or VC combined with astragalus polysaccharide injection (VC-APS). There was significant improvement in quality of life of the patients in the VC-APS group following three cycles of treatment. But no improvement was seen in tumor response or survival.

This analysis included 34 randomized studies involving 2,815 patients. Results suggest that when used along with with platinum-based chemotherapy, astragalus-based medicine improved survival, tumor response, performance status, and reduced chemotherapy toxicity when compared with chemotherapy alone.

Four clinical trials were included in a review to find out the effects of astragalus (Huangqi) compounds on the quality of life, side effects of chemotherapy, and on adverse effects in colorectal cancer patients. A decoction of Huangqi compounds was used in combination with chemotherapy in three studies, whereas the fourth study compared Huangqi compounds with two other Chinese herbal formulas. Patients who were given Huangqi compounds had less nausea and vomiting and decrease in the rate of leucopenia (low white blood cell count) compared to those treated with chemotherapy alone in the three studies or with other Chinese formulas in the fourth study.

Do Not Take If

- You are taking **immunosuppressants** such as **tacrolimus** and **cyclosporine** (astragalus may lessen their effects).

Side Effects

None known

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