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Introduction

Garlic has been used as a food, spice and medicine for centuries (Milner 2001, Morihara et al. 2006, Morihara et al. 2007, Pittler and Ernst 2007, Su et al. 2008). Garlic contains a sulphur based compound called alliin, which, in common with many plant and herbal extracts, has been suggested to act as an anti-oxidant and anti-inflammatory agent, though the mechanisms of action are still unknown (Amagase et al. 2001, Amagase 2006, Su et al. 2008). Garlic has traditionally been used for the treatment of a range of health conditions such as the common cold and hypercholesterolaemia, but only recently been subjected to scientific research to verify these claims.

Garlic supplements can be made from whole fresh garlic, dried or freeze-dried garlic, garlic oil, and aged garlic extracts. It is one of the most popular herbal remedy supplements on the market (Pittler and Ernst 2007, Borrelli et al. 2007). Garlic is ingested as food, and in the form of garlic oil, tablets or capsules. It can also be applied topically. It is used widely by both the general and athletic populations for a wide range of conditions, but there is little or no scientific research to support any beneficial effects.

Health benefit claims for consuming garlic

There is an increasing body of research, and reviews of this research, being published on the use of Garlic for a range of health conditions. These include Cancer (Fleischauer et al. 2000, Milner 2001, Tanaka et al. 2006, Ishikawa et al. 2006), the common cold (Josling 2001), Fatigue (Morihara et al. 2006, Morihara et al. 2007), hypercholesterolaemia (Stevinson et al. 2000, Kojuri et al. 2007, Sobenin et al. 2008), hypertension (Silagy et al. 1994, Ried et al. 2008), peripheral arterial disease (Jepson et al 1997), and pre-eclampsia and complications (Meher et al. 2006).

The evidence base for the use of garlic for the prevention and/or treatment of these conditions is currently limited, with the findings of the majority of studies proving to be inconclusive. Some studies have demonstrated positive outcomes for cardiovascular disease, but the clinical significance of these is debatable. Therefore, at this point in time, garlic can not be recommended as a treatment for any of the above conditions.

The proposed athletic benefits of consuming garlic

In regards to garlic and athletic performance, there is currently no evidence that consuming garlic will enhance performance and only one study was found assessing garlic supplementation with exercise in a healthy population. This study by Su et al. (2008) has evaluated garlic supplementation for exercise-induced muscle damage. Eight male and eight female subjects were randomly allocated to ingest 80mg of allicin (garlic) or 80mg of maltodextrin. Subjects consumed the allicin or placebo capsules daily for two weeks prior to completing a downhill treadmill running protocol to induce muscle damage. Plasma creatine kinase (CK), muscle-specific creatine kinase (CK-MM), lactate dehydrogenase, Interleukin-6 (IL-6), superoxide dismutase, total antioxidative capacity, and perceived muscle soreness were measured before and after the downhill treadmill run.

The subjects consuming the allicin reported a reduced rate of perceived exertion, and had significantly lower plasma levels of CK, CK-MM and IL-6 after downhill run when compared with the control group, and it was therefore concluded by the authors that garlic might be a potential treatment for exercise induced muscle damage. It should be noted that CK is not generally considered a valid marker of muscle damage. The IL-6, however, remained low in the allicin group, whereas it increased significantly in the control group. This may indicate possible anti-inflammatory effects from consuming the allicin supplement, as IL-6 will generally increases after muscle damaging exercise. The study design is weak, however, and the number of subjects too small for any conclusive result from this single study.
Concerns with garlic supplementation

Despite the lack of scientific evidence to support the benefit of garlic supplementation, much of the research to date does not report negative side effects from consuming garlic, and garlic supplementation is generally considered safe. However, a review by Borelli et al. (2007) summarises and discusses possible adverse effects from garlic supplementation. These include bad breath and body odour, allergic reactions, photoallergy, cutaneous manifestations (garlic burns when garlic is applied topically), coagulation alterations such as increased clotting time, gastrointestinal disturbances such as nausea, bloating, flatulence, and herb-drug interactions, specifically with medications such as blood thinners, anti-platelet inhibitors, or protease inhibitors (Borelli et al. 2007). Other reported symptoms such as heartburn and diarrhoea were reported by Berthold et al. (1998) and headache, myalgia and fatigue were reported in one study by Holzgartner et al. (1992), cited in Braun and Cohen (2007).

Conclusion

Garlic has been used over thousands of years for medicinal purposes, and health claims credited to the ingestion of garlic have predominantly come from anecdotal evidence and traditional use. The scientific evidence for garlic supplementation for most health conditions is limited, and in most cases inconclusive. There is no evidence that garlic supplementation will enhance athletic performance, and only one study assessed the supplementation of garlic for the prevention and treatment of exercise induced muscle damage. This study stands alone and further research is required among athletic populations.

It does not appear that garlic supplementation will in anyway hinder athletic performance, though if scientific evidence regarding the anecdotal claims of garlic for enhancing immunity progresses, garlic may become an option for athletes who are at an increased risk of illnesses such as the common cold. As with many herbal supplements and preparations, more research is required to verify the traditional claims made by these products.

Notes

Pubmed (Medline), SPORTDiscus and the Cochrane Library were searched for all human studies published in peer reviewed journals in the last 5 years. The terms: “garlic” and “garlic AND exercise” were used as key terms in all databases.

Inclusion criteria

- Human studies published in English
- Original investigations assessing the use of garlic and exercise
- Incorporated the use of an indistinguishable placebo

Exclusion Criteria

- Studies assessing garlic consumption
- Garlic used as a medicine
- Studies assessing the effect of garlic consumption in diseased populations
- Qualitative studies assessing supplement use in both the general and athletic population

After title and abstract review, only one original article that assessed the use of garlic and exercise was retrieved for review.
References


Kojuri J, Vosoughi AR, Akrami M. Effects of anethum graveolens and garlic on lipid profile in hyperlipidemic patients. Lipids Health Dis. 2007 Mar 1;6:5.


