

LETTERS TO THE EDITOR

In Vitro Efficacy of a Compound Derived From Garlic Against *Pneumocystis carinii*

To the Editor:

The crude extract of garlic and some of its isolated sulfur compounds have shown efficacy in in-vitro and in-vivo studies against major opportunistic microbes in acquired immunodeficiency syndrome (AIDS) including *Salmonella*, *Mycobacterium*, *Candida*, *Coccidioides*, cytomegalovirus (CMV), *Cryptococcus*, herpes simplex types 1 and 2, *Histoplasma*, *Entamoeba*, and *Crystosporidium*.^{1,2} Preliminary in vitro studies done with a compound derived from garlic, diallyl trisulfide (allitride), revealed impressive data of this compound's efficacy against the replication of *Pneumocystis carinii* and its trophozoites in tissue culture. *Pneumocystis carinii* pneumonia is the most common and deadly opportunistic infection in AIDS. Anecdotally, some AIDS patients have unexpectedly survived bouts of the pneumonia with various garlic preparations.

At the Beijing University Medical Center, this compound is given intravenously to bone-marrow transplant patients as a prophylaxis and cure for CMV-fungi infections in the 90-day clinically induced immunodeficient post-transplant period that is required for allograft acceptance. It is of interest to note that most or all of these microbes have lipid-rich capsules. Garlic is known to inhibit lipogenesis. When this compound is compared with bactrim in tissue cultures, a similar efficacy is noted for 7 days. In vitro trials were done in the Division of AIDS, National Institute of Allergy and Infectious Diseases, National

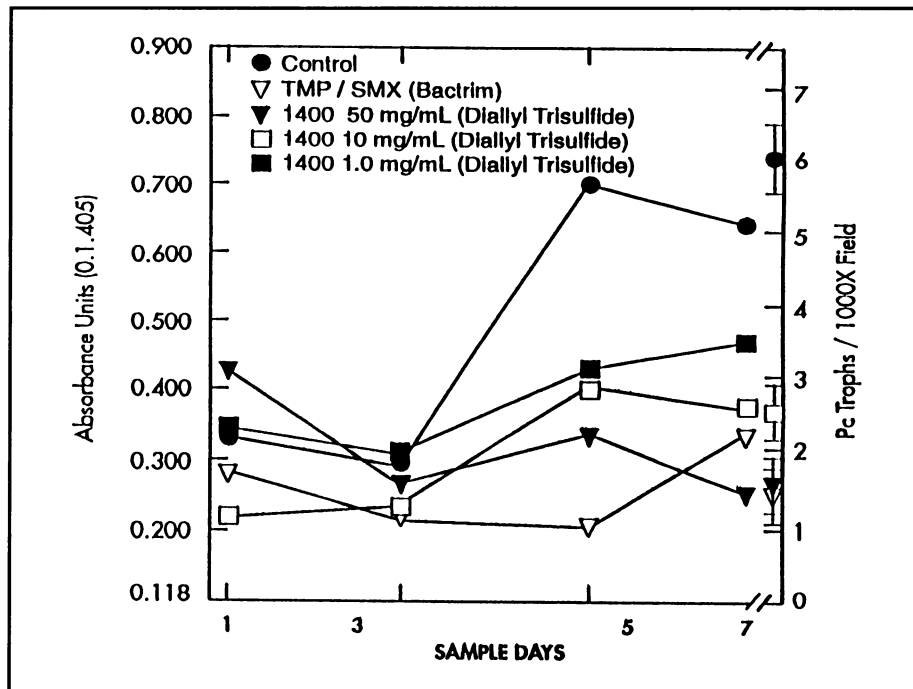


Figure. Note the similar efficacy of a garlic derivative, diallyl trisulfide, and bactrim against the multiplication of *P carinii* trophozoites in vitro. Incubate concentrations <50 mg/mL were not as efficacious.

Institutes of Health, Bethesda, Maryland (Figure).

This herb may have a strategic role to play in the AIDS pandemic as a broad-spectrum antimicrobial (eg, bacteria, fungi, viruses, protozoans, and worms). Synergistic activity has been seen with ganciclovir against cytomegalovirus in vitro. In vitro studies have shown diallyl trisulfide to be efficacious against other members of the herpes family. Because of this herb's antioxidant activity, it may protect patients from the toxicity and free-radical damage of current medications for these opportunistic microbes. In laboratory animals, garlic compounds have given protection against carcinogens and toxic chemicals.

Components of garlic may have immunomodulating activity.³⁻⁵ Natural killer cell activity was en-

hanced when raw and aged preparations of garlic were administered orally to normal and AIDS subjects in preliminary trials. Intralesional administration of an aged garlic extract to experimental bladder carcinoma cells implanted into the hind legs of rats resulted in the disappearance of most or all of the growing tumor nodules within 6 weeks. Grossly, the intraperitoneal administration of this garlic preparation caused significant shrinkage and microscopically, an intense proliferation of immune cells surrounding these nodules.¹

The tissue culture studies showing the efficacy of bactrim and allitride against *P carinii* and its trophozoites are based on an experimental system. They are not necessarily predictive of the results in animal or human studies, but these and other data strongly suggest that

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about an initiative through a "grassroots" approach of church and community organizations, along with a global approach through news, television, and radio media. As part of the awareness promotion campaign, it must be emphasized that the study is safe and provides benefits to enrollees.

The success of health programs is largely dependent on community acceptance, which must be established in the pre-program planning stages of the initiative. This concept of obtaining community approval and acceptance prior to program initiation is not a new one, nor does it exclusively apply to the African-American community. Community leaders and members need to have a vested interest in such a program and a sense of empowerment. Through this type of communication, patient enrollment and community satisfaction can be substantial. Such success can serve as a springboard for other targeted health-care studies or programs in high-risk communities.

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further investigations are warranted of this herb's potential in AIDS, cancer, and infections.

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