

Antibacterial activity of a new, stable, aqueous extract of allicin against methicillin-resistant *Staphylococcus aureus*.

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The increasing prevalence of methicillin-resistant *Staphylococcus aureus* (MRSA) in hospitals and the community has led to a demand for new agents that could be used to decrease the spread of these bacteria. Topical agents such as mupirocin have been used to reduce nasal carriage and spread and to treat skin infections; however, resistance to mupirocin in MRSA is increasing. Allicin is the main antibacterial agent isolated from garlic, but natural extracts can be unstable. In this study, a new, stable, aqueous extract of allicin (extracted from garlic) is tested on 30 clinical isolates of MRSA that show a range of susceptibilities to mupirocin. Strains were tested using agar diffusion tests, minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). Diffusion tests showed that allicin liquids produced zone diameters >33 mm when the proposed therapeutic concentration of 500 microg/mL (0.0005% w/v) was used. The selection of this concentration was based on evidence from the MIC, MBC and agar diffusion tests in this study. Of the strains tested, 88% had MICs for allicin liquids of 16 microg/mL, and all strains were inhibited at 32 microg/mL. Furthermore, 88% of clinical isolates had MBCs of 128 microg/mL, and all were killed at 256 microg/mL. Of these strains, 82% showed intermediate or full resistance to mupirocin; however, this study showed that a concentration of 500 microg/mL in an aqueous cream base was required to produce an activity equivalent to 256 microg/mL allicin liquid.

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