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Atherosclerosis. 1998 Aug;139(2):333-9.

Effect of allicin and ajoene, two compounds of garlic, on inducible nitric oxide synthase.

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Abstract

Inducible nitric oxide synthase (iNOS) has recently been shown to be present in human atherosclerotic lesions and to promote the formation of deleterious peroxynitrite. Allicin and ajoene are discussed as active compounds with regard to the beneficial effects of garlic in atherosclerosis. The aim of this study was to investigate the effect of allicin and ajoene on the iNOS system in lipopolysaccharide (LPS)-stimulated RAW 264.7 macrophages. Ajoene (IC50 2.5-5 microM) and allicin (IC50 15-20 microM) dose dependently reduced nitrite accumulation, a parameter for NO synthesis, in supernatants of LPS-stimulated (1 microg/ml, 20 h) macrophages. Accordingly, reduced iNOS enzyme activities were measured by conversion of L-[3H]arginine to L-[3H]citrulline in homogenates of LPS-activated cells treated with ajoene or allicin. None of these compounds, however, showed a direct effect on the catalytic-activity of iNOS. Consequently, iNOS protein and mRNA expression in ajoene (10 microM) or allicin (50 microM) treated cells were evaluated by Western blot and Northern blot analysis, respectively. Markedly reduced iNOS protein as well as mRNA levels were demonstrated. These observations indicate that allicin and ajoene inhibit the expression of iNOS in activated macrophages. The possible link of this effect to the beneficial features attributed to garlic is discussed.

PMID: 9712340 [PubMed - indexed for MEDLINE]

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