

Human Metabolism 2019: Allicin from garlic having beneficial effects in combating diseases - Najmul Islam - Aligarh Muslim University

Najmul Islam

Aligarh Muslim University, India

Introduction & Aim: The relationship between Reactive Oxygen Species (ROS) and various diseases like metabolic cardiac disorders, osteoporosis, tuberculosis and cancer are well documented. The present study involves the employment of a natural compound namely allicin from garlic having antioxidant and anti-inflammatory properties with proven health benefits. Our preliminary observations appear to possibly provide some scientific input that may be useful in the management of Ischemic Heart Disease (IHD), osteoporosis, tuberculosis and cancer.

Method: Peripheral Blood Mononuclear Cells (PBMC's) were isolated by density gradient method from blood of patients with Ischemic Heart Disease (IHD), osteoporosis, tuberculosis and cancer (n=20 each) and were employed in culture studies with and without varying doses of allicin (0-500 ng/ml). The 24 hr cultures were probed for CK, sTNF-alpha, sRANKL levels as well as for Glutathione Peroxidase (GPx) activity.

Result: Cells were collected after 24 hours with and without allicin (0-500 ng/ml; n=20 each). An appreciably suppressed GPx activity was recorded in cell cultures of patient's with IHD, osteoporosis, tuberculosis and cancer when compared to samples of healthy controls where the GPx data reflects upon the compromised defense system in patients with Ischemic Heart Disease (IHD). On the contrary, treatment or co-culturing with varying doses of allicin (0-500 ng/ml) exhibited a remarkable degree of amelioration in GPx activity in cells of all the above four types of diseased patients. Next, the ELISA data showed that the 24 hr culture supernatants of untreated patients cells were having augmented expressions of sTNF-alpha, which upon co-culturing with 500 ng/ml of allicin resulted in an

appreciable degree of downregulation/suppression in the expressions of sTNF-alpha in cells of all the above four types of diseased patients. Cultures from all patient types exhibited a dose dependent suppression with allicin. Similarly, in IHD patients, in comparison to untreated controls, a dose dependent decrease in CK levels were observed in cultures receiving allicin (0-500 ng/ml; n=10). Also, in cell cultures from osteoporosis patients, allicin (0-500 ng/ml), showed an appreciable degree of downregulation in sRANKL. Here, we studied the effects of garlic allicin on secreted TNF- α and IFN- γ as well as on glutathione peroxidase (GPx) in the culture supernatants of monocytes from patients with vaginal infections. We have previously shown that allicin at lower doses does not affect the viability of monocytes and, therefore, these concentrations were used in the present study. The most striking finding of the present study is the allicin-induced suppression of expression of protein-soluble TNF which has been coupled with a simultaneous α increase in IFN- γ and GPx activity soluble in monocytes from patients. The antioxidant GSH plays an important role in improving immune functions and cell detoxification. Allicin, which is the main biologically active component and thiosulfinate compound of freshly crushed garlic, has been reported to have various biological actions such as antimicrobial, antiparasitic and antifungal activities.¹⁵ Allicin exhibits its antimicrobial activity by rapid and total inhibition of RNA synthesis.

Conclusion: The encouraging preliminary data suggested that in-depth studies are required at the molecular level, which in turn, may provide information for possibly employing allicin as potential adjunct in the management of Ischemic Heart Disease (IHD), osteoporosis, tuberculosis and cancer.