

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

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Introduction and Aim: The relationship between Reactive Oxygen Species (ROS) and various diseases like metabolic cardiac disorders, osteoporosis, tuberculosis and cancer and 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). Garlic has acquired a reputation in different traditions as a prophylactic as well as therapeutic medicinal plant. The most important role of garlic has played in dietary and medicinal roles throughout the history. Some of the earliest references to this medicinal plant were found in Veda, a collection of Zoroastrian holy writings that was probably compiled during the sixth century BC. Garlic has also played as an important medicine to Sumerian and the ancient Egyptians. There is some another evidence that during the earliest of Olympics in Greece, the garlic was fed to the athletes for increasing the more stamina. Garlic is a bulbous plant; which grows up to 1.2 m in height. And easy to grow and can be grown in mild climates. The Garlic is of different types with subspecies of garlic, it is most notably like hard neck garlic and soft neck garlic. Allicin is the principal bioactive compound present in the aqueous extract of garlic or raw garlic homogenate. When garlic is chopped or crushed, allinase enzyme is activated and produce from alliin. There is appreciable epidemiologic evidence that demonstrates therapeutic and preventive roles for garlic. With a Several experiments and clinical investigations suggest many favourable effects of garlic and its preparations.

These effects have been largely attributed to i) more reduction of risk factors for cardiovascular diseases, ii) Reduction with cancer risk, iii) it has antioxidant effect, iv) it is also consists of antimicrobial effect, and v) The enhancement of detoxification foreign compound and hepatoprotection. Garlic and its preparations have been widely recognized as agents for prevention and treatment of cardiovascular diseases. The wealth of scientific literature supports proposal of garlic consumption have good significant effects on lowering blood pressure, prevention of atherosclerosis, reduction of serum cholesterol and triglyceride, inhibition of platelet aggregation, and increasing fibrinolytic activity, Another widely studied garlic preparation is aged garlic extract. Sliced draw garlic stored in 15-20% ethanol for more than 1.5 year is refereed to aged garlic extract. The Complete process is supposed to cause the significant loss of allicin and increased activity of certain new

compounds, like S-allylcysteine, sallylmercaptocysteine, allixin, L-arginine, and selenium which are stable and significantly antioxidant. Medically used, garlic oil is mostly prepared by steam-distillation process. Steam-distilled garlic oil consists of the diallyl, allylmethyl, and dimethyl mono to hexa sulphides. It has been suggested that the mechanism of antihypertensive activity of garlic is due to its prostaglandin-like effects, which decrease peripheral vascular resistance, Garlic and its preparations have been widely recognized as agents for prevention and treatment of cardiovascular diseases.

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 of varying does 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).

Result: The Tested Cells were collected after 24 hours with and without allicin. 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 defence 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.

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.