Accordingly, further clinical studies are required in which standardized formulations of garlic with known compositions can be used. Such methodological shortcomings, the use of different formulations/preparations of garlic and different time scales of the studies, aggregation and reduction of blood pressure and glucose. However, some contradictory results have also emerged as a result of points to the fact that garlic can bring about the normalization of plasma lipids, enhancement of fibrinolytic activity, inhibition of platelet aggregation and reduction of blood-clotting time and increased platelet aggregation. Dietary therapy is the first step in the treatment of hyperlipidaemia of rats for a period of 30 days. Oral administration of the formulation, Caps HT2 (100, 200, 300 and 400 mg/kg) significantly raised HDL cholesterol levels. The atherogenic index and the reduction in body weight were significant indicating the effectiveness against hyperlipidaemia and obesity. All these results revealed the therapeutic potential of Caps HT2 against vascular intimal damage and atherogenesis leading to various types of cardiovascular problems.

Prevention of atheromatous heart disease.


Five thousand patients of atheromatous heart disease, presented as angina pectoris, were studied over a period of five years. After adding the 'Husk of Isabgol' and 'Aloe vera' (an indigenous plant known as ghee-guar-ka-patthha) to the diet, a marked reduction in total serum cholesterol, serum triglycerides, fasting and post prandial blood sugar level in diabetic patients, total lipids and also increase in blood-clotting time and increased platelet aggregation. The patients, most benefitted, were diabetics adding the 'Husk of Isabgol' and 'aloe vera' (an indigenous plant known as ghee-guar-ka-paththa) to the diet, a marked reduction in total serum cholesterol, serum triglycerides, fasting and post prandial blood sugar level in diabetic patients, total lipids and also increase in blood-clotting time and increased platelet aggregation. The patients, most benefitted, were diabetics

Fórmula Ayurvedica

Antiatherogenic effect of Caps HT2, a herbal Ayurvedic medicine formulation. Phytomedicine. 2003;10(6-7):474-82.

Mary NK, Babu BH, Padikkala J. Amala Cancer Research Centre, Thrissur, Kerala, India.

The antiatherogenic effect of a herbal formulation, Caps HT2, was evaluated as antioxidant, anticoagulant, platelet antiaggregatory, lipoprotein lipase releasing, anti-inflammatory and hypolipidaemic activity in rats. The formulation contained the methanolic extracts of selected parts of plants, Commiphora mukul, Allium sativum, Plumbago indica, Semecarpus anacardium, Hemidesmus indicus, Terminalia arjuna, Tinospora cordifolia, Withania somnifera and Ocimum sanctum. The formulation, Caps HT2 was found to scavenge superoxide and hydroxyl radicals; the IC50 required being 55.0 and 610.0 microg/ml respectively. The lipid peroxidation was found inhibited (50%) by 48.5 microg/ml of Caps HT2. The intravenous administration of the formulation (5 mg/kg) delayed the plasma recalcification time in rabbits and enhanced the release of lipoprotein lipase enzyme significantly (p < 0.001). The formulation also inhibited ADP induced platelet aggregation in vitro, which was comparable to commercial heparin. The anti-inflammatory action of the formulation was significant (p < 0.001) with acute and chronic inflammations induced by carrageenan and formalin respectively in rats. The hypolipidaemic effect of Caps HT2 was significant (p < 0.001) with the administration of the formulation, in diet-induced hyperlipidaemia of rats for a period of 30 days. Oral administration of the formulation, Caps HT2 (100, 200, 300 and 400 mg/kg) significantly raised HDL cholesterol levels. The atherogenic index and the reduction in body weight were significant indicating the effectiveness against hyperlipidaemia and obesity. All these results revealed the therapeutic potential of Caps HT2 against vascular intimal damage and atherogenesis leading to various types of cardiovascular problems.

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Historical perspective on garlic and cardiovascular disease.

J Nutr; 131(3s): 977S-9S, 2001 Mac Rahaman K

Resumo: Cardiovascular disease is a complex and multifactorial disease characterized by such factors as high cholesterol, hypertension, reduced fibrinolysis, increase in blood-clotting time and increased platelet aggregation. Dietary therapy is the first step in the treatment of hyperlipidaemia; garlic has been used medicinally for centuries and is still included in the traditional medicine of many cultures. Historically, there has been great interest in the role of garlic in reducing cardiovascular risk factors. Evidence from numerous studies points to the fact that garlic can bring about the normalization of plasma lipids, enhancement of fibrinolytic activity, inhibition of platelet aggregation and reduction of blood pressure and glucose. However, some contradictory results have also emerged as a result of methodological shortcomings, the use of different formulations/preparations of garlic and different time scales of the studies. Accordingly, further clinical studies are required in which standardized formulations of garlic with known compositions can be used. Such
formulations (e.g., Aged Garlic Extract) are now available and are being investigated. Evidence obtained from these studies indicates that garlic has potential in the prevention and control of cardiovascular disorders and is beneficial when taken as a dietary supplement.

Garlic: a secret miracle of God?


País de publicação: SWITZERLAND

Resumo: Garlic belongs to the oldest traditional medicinal plants. It has already been mentioned 1500 A. D. in an ancient egyptian medical script, the Papyrus Ebers. In modern times antitumoral and antiarteriosclerotic effects are attributed to garlic-derived drugs. These effects could be demonstrated in vitro and appear to be supported by epidemiologic studies. Production of commercial products and pharmacologic studies, however, are rendered more difficult by chemical instability and low bioavailability of the active drugs. Clinical studies on effects and case reports about side effects of garlic consumption are summarized in this paper.

Effects of garlic on atherosclerosis.

Nutrition;13(7-8):656-63, 1997 Jul-Aug. Orekhov AN; Grünwald J

Institute of Experimental Cardiology, Cardiology Research Center of the Russian Academy of Medical Sciences, Moscow, Russia

Resumo: This review discusses the use of garlic and garlic preparations as agents for prevention and treatment of atherosclerosis and arteriosclerosis-related diseases. Garlic indirectly effects atherosclerosis by reduction of hyperlipidemia, hypertension, and probably diabetes mellitus and prevents thrombus formation. In addition, in animal models, garlic causes direct antithrombotic (preventive) and antithrombogenic regression effects at the level of artery wall. Garlic's effect on atherosclerosis may be explained by its capacity to reduce lipid content in arterial cells and to prevent intracellular lipid accumulation. This effect, in turn, is accompanied by other antithrombotic manifestations, i.e., stimulation of cell proliferation and extracellular matrix synthesis. Clinical trials are currently being carried out to reveal the possible effect of garlic therapy on human atherosclerosis. Positive results of these trials may open a new era in the use of garlic for prevention and treatment of many atherosclerosis-related diseases.

Cardiovascular benefits of garlic (Allium sativum L).


Brace LD.

Department of Pathology, College of Medicine, University of Illinois at Chicago

Although garlic is believed to have health-promoting benefits, many of the claimed benefits are not supported by good scientific studies. This review critically examined current scientific literature concerning claims of cardiovascular benefits from regular consumption of garlic and garlic preparations. The vast majority of recent randomized, placebo-controlled studies do not support a role for garlic in lowering blood lipids. There also is insufficient evidence to support a role in reducing blood pressure. While there have been indications of antithrombotic effects associated with garlic consumption, there are insufficient data in humans. Investigation of antithrombotic effects of garlic consumption appears to hold promise, but too few data exist to draw firm conclusions.

Use of allikor for the normalization of fibrinolysis and hemostasis in patients with chronic cerebrovascular diseases


Andrianova IV, Ionova VG, Demina EG, Shabalina AA, Karabasova IaA, Litova LJ, Povorinskaia TE, Orekhov AN.

A new form of garlic preparation--long-acting tablets of garlic powder allikor has been studied in patients with cerebral arteriosclerosis (CA) complicated by chronic cerebrovascular pathology. A double blind placebo-controlled trial examined allikor effects on hemostasis and fibrinolysis in cross-over groups at two stages. At the first stage all patients were given group 1 (n = 15) received allikor in a dose 600 mg/day; patients of group 2 (n = 14) were given placebo. At the second stage group 1 received placebo and group 2 allikor in the same regimen. Before the treatment allikor effects on platelet aggregation and fibrinolysis were studied in vitro (20 patients). Allikor significantly inhibited ADP-induced platelet aggregation in vitro and ex vivo, reduced blood fibrinogen, normalized initially low fibrinolytic activity and fibrinolysis index. Due to the above properties allikor can be used for prevention and treatment of CA complicated by chronic cerebrovascular pathology.

Review: cardiovascular effect of garlic (Allium sativum)


Garcia Gomez LJ, Sanchez-Muniz FJ.

Departamento de Nutrición y Bromatología I (Nutrición), Facultad de Farmacia, Universidad Complutense de Madrid, Madrid-España.

Garlic has been used for centuries, and even nowadays is part of popular medicine in many cultures. New data have increased the interest in garlic and its role in normalization and treatment of cardiovascular disease risk factors. Recent studies have shown the complex composition of garlic, containing many compounds, that present potential positive effect in the field of health. The aim of the present paper was to review results of some studies that have found a relationship between garlic and cardiovascular diseases. From some of them it can be summarized that garlic can normalize plasma lipid, check lipid peroxidation, stimulate fibrinolytic activity, inhibit platelet aggregation, smooth the thickening and structural changes of artery wall related to aging and atherosclerosis, and decrease blood pressure. However, some other studies do not support these benefits. The positive effects found have promoted many study projects, nevertheless, the extract liability and the lack of result consensus call for a moderate consumption of garlic and garlic extracts. The composition variation due to gathering and aging together with the changes occurring in canning and industrial treatment makes necessary the application of some norms in the production and consumption of this functional food in order to guarantee its use in adequate form and doses.

Garlic shows promise for improving some cardiovascular risk factors.


Ackermann RT, Mulrow CD, Ramirez G, Gardner CD, Morbidoni L, Lawrence VA.

Audie L. Murphy Memorial Veterans Hospital

OBJECTIVES: To summarize the effects of garlic on several cardiovascular-related factors and to note its adverse effects. METHODS: English and non-English citations were identified from 11 electronic databases, references, manufacturers, and experts from January 1966 through February 2000 (depending on the database searched). Reports of cardiovascular-related effects were limited to randomized controlled trials lasting at least 4 weeks. Reports of adverse effects were not limited by study design. From 1798 pertinent records, 45 randomized trials and 73 additional studies reporting adverse events were identified. Two physicians abstracted outcomes and assessed adequacy of randomization, blinding, and handling of dropouts. Standardized mean differences of lipid outcomes from randomized controlled trials were adjusted for baseline differences and pooled using random effects methods. RESULTS: Compared with placebo, garlic preparations may lead to small reductions in the total cholesterol level at 1 month (range of average pooled reductions,
Dehydration is known to significantly reduce both the time required for the first platelet aggregate and the time to full occlusion in photochemically-induced thrombosis, in vivo. Ultrastructural changes that contribute to such events remain unknown. Therefore, the effect of water deprivation for 24 hr, as a model for dehydration, on the ultrastructure of mouse pial microvessels was investigated. The ultrastructural effect of garlic in preventing such ultrastructural changes was also investigated. Four groups of TO strain: control, control-garlic treated, dehydrated, and dehydrated-garlic treated male mice, 10/group, were used. Dehydration was induced by water deprivation for 24 hr. Garlic solution was i.p. injected at 0.1 ml/10g body weight. In urethane-anesthetized (2 mg/g, i.p.) mice, topical and transvessel bimodal fixation of pial microvessels was done with a phosphate buffered mixture of glutaraldehyde and paraformaldehyde, followed by a conventional electron microscopy procedure. Examination of control cerebral pial microvessels showed no evidence of cellular damage. Membranes of endothelial cells were intact. Within pial microvessels there was no evidence of platelet aggregation. Garlic treatments did not cause any ultrastructure abnormalities in control mice. Compared with control, dehydration caused the appearance of thrombi that consisted of platelet aggregates. Discoid platelets containing granules, spheroid degranulated platelets, and those with large pseudopodia were present in 80% of dehydrated mice. The venular endothelial surface of dehydrated mice revealed dilated profiles of endoplasmic reticulum and variously shaped vacuoles. Swelling of nuclear envelopes and microtubules were also observed in dehydrated mice. Concomitant garlic treatment prevented most of these ultrastructural changes. These findings demonstrated the extent of damage to the pial microvessels in response to water deprivation and demonstrated the beneficial effect of garlic as a possible mean of protection against oncoming vascular pathology.

Molecular basis by which garlic suppresses atherosclerosis.
J Nutr. 2001 Mar;131(3):1006S-9S.
Campbell JH, Efendy JL, Smith NJ, Campbell GR.
Centre for Research in Vascular Biology, Department of Anatomical Sciences,
The aim of this study was to determine the mechanism by which the aged garlic extract "Kyolic" has a protective effect against atherosclerosis. Plasma cholesterol of rabbits fed a 1% cholesterol-enriched diet for 6 wk was not reduced by supplementation with 800 microL Kyolic/(kg body d). In spite of this, Kyolic reduced by 64% (P < 0.05) the surface area of the thoracic aorta covered by fatty streaks and significantly reduced aortic arch cholesterol. Kyolic also significantly inhibited by approximately 50% the development of thickened, lipid-filled lesions in preformed neointimas produced by Fogarty 2F balloons lesions in catheter injury of the right carotid artery in cholesterol-fed rabbits. In vitro studies found that Kyolic completely prevented vascular smooth muscle phenotypic change from the contractile, high volume fraction of filament (V(v)/myo) state, and inhibited proliferation of smooth muscle cells in the synthetic state with a 50% effective dose (ED(50)) of 0.2%. Kyolic also slightly inhibited the accumulation of lipid in cultured macrophages but not smooth muscle, and had no effect on the expression of adhesion molecules on the surface of the endothelium or the adherence of leukocytes. It is concluded that Kyolic exerts antithrombotic effects through inhibition of smooth muscle phenotypic change and proliferation, and by another (unclarified) effect on lipid accumulation in the artery wall.

Dietary supplementation with aged garlic extract inhibits ADP-induced platelet aggregation in humans.
Rahman K, Billington D.
School of Biomolecular Sciences, Liverpool John Moores University, Liverpool L3 3AF, UK.
Garlic has been widely reported to protect against cardiovascular disease by reducing serum cholesterol concentrations and blood pressure and by inhibiting platelet aggregation. However, most of these studies have been performed in hypercholesterolemic subjects or in animal models. We performed a 13-wk study in normolipidemic subjects who ingested 5 mL of aged garlic extract (AGE, Kyolic) per day. Blood was drawn from these subjects at the beginning and end of the study. Aggregation of platelet-rich plasma was induced by ADP; full lipid profiles and liver function tests were determined on serum, and plasma concentrations of eicosanoids were also measured. Dietary supplementation with AGE significantly inhibited both the total percentage and initial rate of platelet aggregation at concentrations of ADP up to 10 micromol/L. The K(M) for ADP-induced aggregation were approximately doubled after supplementation with AGE, whereas the maximum rate of aggregation was unaffected. No significant changes in plasma thromboxane B(2) and 6-ketoprostaglandin F(1alpha) concentrations or serum lipid profiles were observed. We conclude that AGE, when taken as a dietary supplement by normolipidemic subjects, may be beneficial in protecting against cardiovascular disease as a result of inhibiting platelet aggregation.

Thromboxane-B(2) levels in serum of rabbits receiving a single intravenous dose of aqueous extract of garlic and onion.
Thomson M, Mustafa T, Ali M.
Department of Biological Science, Kuwait University, Safat, Kuwait.
We have shown previously that fresh garlic extract is effective in reducing thromboxane formation by platelets both in vivo and in vitro animal models of thrombosis. In the present study, the effect of different concentrations of a single dose of aqueous extracts of garlic and onion were evaluated on serum thromboxane-B(2)synthesis in rabbits. Different concentrations of garlic and onion were administered as single doses in the ear vein of rabbits. Rabbits were bled before and at different intervals after the infusion of garlic or onion extracts. Venous blood was collected and allowed to clot at 37 degrees C for 1 h. Thromboxane-B(2)level was measured in the serum by radioimmunoassay. It was observed that garlic inhibits the thrombin-induced platelet synthesis of TXB(2)in a dose-and time-dependent manner. Maximum inhibition of TXB(2)occurred between 0.5 h and 6 h at 25 and 100 mg kg(-1)garlic. At 24 h post-garlic infusion TXB(2)inhibition was reduced to 15% of the control and TXB(2)levels were comparable to that of the control values at 72 h post-garlic infusion. Infusion of 100 mg kg(-1)onion extract did not elicit any inhibitory effect on TXB(2)synthesis in the serum of rabbit during the treatment period. The rapid recovery of platelet cyclooxygenase activity after infusion of a single dose of garlic suggests that garlic should be taken more frequently in order to achieve beneficial effects in the prevention of thrombosis.

Garlic for peripheral arterial occlusive disease.
Jepson RG, Kleijnen J, Leng GC.
Background: Commercially available preparations of garlic have been reported to have beneficial effects on some of the risk factors associated with atherosclerosis. Objectives: The objective of this review was to assess the effects of garlic (both dried and non-processed preparations) on the treatment of peripheral arterial occlusive disease. Search strategy: The reviewers searched the Cochrane Peripheral Vascular Diseases Group trials register, AMED, EMBASE, BIDS ISL, abstracts of relevant symposia and reference lists of relevant articles up to August 1998. The reviewers also contacted pharmaceutical companies, investigators, and experts in garlic therapies. Selection criteria: Randomised trials of garlic therapy in patients with lower limb atherosclerosis. The main outcomes were objective measures of progression of underlying atherosclerosis (e.g. ankle pressure measurements, treadmill test results) and subjective outcomes (e.g. symptom progression). Data collection and analysis: At least two reviewers extracted data and assessed trial quality independently. The reviewers contacted investigators to obtain information needed for the review that could not be found in published reports. Main results: One eligible trial with 78 participants was found. Both men and women (aged 40–75) were included. The follow-up period was short, 12 weeks only. After twelve weeks of treatment, pain-free walking distance increased from 161 to 207 m in the group on garlic and from 172 to 203 m in the placebo group. This was not a statistically significant difference. Reviewer's conclusions: One small trial of short duration found no effect on walking distance.

The antiatherosclerotic effect of Allium sativum.
Institute for Transfusion Medicine and Immunohematology, University Clinic Charite of the Humboldt University, Berlin, Germany.

In a randomized, double-blind, placebo-controlled clinical trial, the plaque volumes in both carotid and femoral arteries of 152 probands were determined by B-mode ultrasound. Continuous intake of high-dose garlic powder dragees reduced significantly the increase in atherosclerotic plaque volume by 5-18% or even effected a slight regression within the observational period of 48 months. Also the age-dependent representation of the plaque volume shows an increase between 50 and 80 years that is diminished under garlic treatment by 6-13% related to 4 years. It seems even more important that with garlic application the plaque volume in the whole collective remained practically constant within the age-span of 50-80 years. These results substantiated that not only a preventive but possibly also a curative role in arteriosclerosis therapy (plaque regression) may be ascribed to garlic remedies.

Garlic and health.
Nutr Metab Cardiovasc Dis;11(4 Suppl):57-65, 2001 Aug. Kk C; Kahane R; Gebhardt R
Resumo: Garlic is a worldwide cultivated crop species which is well-known for its health beneficial effects. In this paper an overview is given on a number of important plant and health aspects of garlic. Furthermore an outline is presented of a European initiative which is aimed at the development of high quality garlic and the identification of biomarkers in atherosclerosis and cancer in humans for disease prevention.

S-allyl cysteine reduces oxidant load in cells involved in theatherogenic process.
Pais de publicação: Germany

[Ab] Resumo: Oxidation of low-density lipoprotein (LDL) and activation of the pleiotropic transcription factor nuclear factor kappa B (NF-kappaB), are often the chemical and molecular alterations associated with the development of the atherosclerotic lesion. We have reported previously on the antioxidant and molecular effects of a garlic compound, S-allyl cysteine (SAC), and its ability to inhibit damage caused by oxidative stress in bovine endothelial cells. In this study, the antioxidant effects of SAC were further determined, using several in vitro assay systems. First, we determined the effect of SAC on CuZn-oxidized induction of LDL. Varying concentrations of SAC were co-incubated with a (standardized CuZn/LDL solution, and LDL-oxidation was then ascertained by determining the formation of thiobarbituric acid reactive substances (TBARS). SAC inhibited LDL-oxidation at an optimum concentration of 1 mM. In another experiment, we determined the effects of SAC on oxidized-LDL (ox-LDL) activation of J774 mouse macrophages and human umbilical vein endothelial cells (HUVEC). Cells were grown on 96-well plates, preincubated with SAC at 37 degrees C and 5% CO2 for 24 h, washed, and exposed to ox-LDL for 24 h. Levels of hydrogen peroxide (H2O2) were determined by a fluorometric assay. In both cell lines, SAC exhibited dose-dependent inhibition of H2O2 formation. We also studied the effects of SAC on NF-kappaB activation in HUVEC using tumor necrosis factor-alpha (TNF-alpha) or H2O2 as stimulators. Cells were grown in 75 cm2 flasks at 37 degrees C and 5% CO2 and were preincubated with SAC 24 h before stimulation with TNF-alpha or H2O2. Nuclear extracts were then prepared and NF-kappaB activation was determined using an electrophoretic mobility shift assay with a 32P-labeled probe. SAC exhibited dose-dependent inhibition of NF-kappaB activation. Our data suggest that SAC may act via antioxidant mechanisms to inhibit the atherogenic process.

Pleiotropic effects of garlic
Wien Med Wochenschr;149(8-10):217-24, 1999. Siegel G; Walter A; Engel S; Walper A; Michel F
Pais de publicação: AUSTRIA

Resumo: Garlic as a herbal remedy reduces a multitude of risk factors which play a decisive role in the genesis and progression of arteriosclerosis: decrease in total and LDL-cholesterol, increase in HDL-cholesterol, reduction of serum triglyceride and fibrinogen concentration, lowering of arterial blood pressure and promotion of organ perfusion, and, finally, enhancement in fibrinolysis, inhibition of platelet aggregation, and diminution of plasma viscosity. In a prospective, 4-year clinical trial with primary endpoint 'arteriosclerotic plaque volume' it was proven not only a 9 to 18% reduction and 3% regression in plaque volume of the total collective under the influence of standardized garlic powder dragees (900 mg/die LI 111), but also of some facets of the phytopharmacologic pleiotropy of this herb: decrease in LDL level by 4%, increase in LDL concentration by 8%, and lowering in blood pressure by 7%. The reduction of arterial blood pressure is due to an additional opening of K(Ca) ion channels in the membrane of vascular smooth muscle cells that effects its hyperpolarization. This membrane hyperpolarization closes about 20% of the L-type Ca2+ channels, consequence of which is vasodilatation. In human coronary arteries, the increase in vascular diameter by 4% is closely associated with an improvement of coronary perfusion by 18%. These pleiotropic effects of garlic result in a reduction of relative cardiovascular risk for infarction and stroke by more than 50%.

Garlic preparations for prevention of atherosclerosis.
Resumo: On the basis of a number of new rigorously designed controlled studies, there is increasingly less evidence for lipid lowering
properties of garlic preparations. Many other aspects of garlic drugs, such as direct effects on vessel walls (aortic elasticity, effects of antioxidant properties on early steps in atherosclerosis formation) or anti-platelet aggregation effects, are still awaiting further elucidation in clinical studies.

**In vitro effect of garlic powder extract on lipid content in normal and atherosclerotic human aortic cells.**

*Lipids; 32(10):1055-60, 1997 Oct. Orekhov AN; Tertov VV*

Institute of Experimental Cardiology, Russian Academy of Medical Sciences, Moscow, Russia.

Resumo: In the present study, the mechanism of the in vitro effect of garlic powder extract (GPE) on lipid content of cultured human aortic cells was investigated. The addition of GPE abolished atherogenic blood serum-induced accumulation of free cholesterol, triglycerides, and cholesteryl esters in smooth muscle cells derived from uninvolved (normal) intima. In cells isolated from atherosclerotic plaque, GPE lowered these lipids. GPE inhibited lipid synthesis both in normal and atherosclerotic cells. It inhibited acyl-CoA:cholesterol acyltransferase activity that participates in the cholesteryl ester formation and stimulated cholesteryl ester hydrolase that degrades cholesteryl esters. This may explain the lipid reduction caused by GPE in atherosclerotic cells. GPE inhibited the uptake of modified low density lipoprotein and degradation of lipoprotein-derived cholesteryl esters, thus considerably reducing the intracellular accumulation of cholesteryl esters. This suggests the mechanism responsible for the prevention of lipid accumulation in aortic cells caused by atherogenic blood serum.

**Aged garlic extract and its constituents inhibit Cu(2+)-induced oxidative modification of low density lipoprotein.**


País de publicação: GERMANY

Resumo: Oxygen radical injury and lipid peroxidation have been suggested as major causes of atherosclerosis, cancer, liver disease, and the aging process. More specifically, oxidative modification of low density lipoprotein (LDL) has been recognized as an important process of atherosclerosis. In this study, we determined the effects of aged garlic extract (AGE), four of its constituents, and a metabolite on Cu(2+)-induced oxidative modification of LDL using an in vitro system. All these compounds were shown to inhibit oxidative modification of LDL.

**Direct anti-atherosclerosis-related effects of garlic.**

*Ann Med; 27(1):63-5, 1995 Feb. Orekhov AN; Tertov VV; Sobenin IA; Pivovarova EM*

Resumo: Direct anti-atherosclerosis-related effects of garlic were studied using cell culture. An aqueous extract from garlic powder (GPE) was added to smooth muscle cells cultured from atherosclerotic plaques of human aorta. During a 24-hour incubation, GPE significantly reduced the level of cholesteryl esters and free cholesterol in these cultured cells and inhibited their proliferative activity. In addition, GPE significantly reduced cholesterol accumulation and inhibited cell proliferation stimulated by blood serum taken from patients with angiographically assessed coronary atherosclerosis, i.e. GPE reduced atherogenic manifestations of patients' serum. Garlic effect on blood atherogenicity of patients with coronary atherosclerosis has also been studied ex vivo. Following a 24-hour incubation with cultured cells, patients' blood serum caused an increase of total cell cholesterol. Blood serum taken 2 hours after an oral administration of 300 mg garlic powder tablet caused substantially less cholesterol accumulation in cultured cells. This suggests that garlic powder manifests direct anti-atherogenic-related action not only in vitro but also in vivo.