

Effects of ascorbic and cinnamic acids on the albumin glycation level in breast cancer patients

Israa G Zainal

Kirkuk University, Iraq

Breast cancer is cancer that forms in the cells of the breasts. After skin cancer, breast cancer is the most common cancer diagnosed in women in the United States. Breast cancer can occur in both men and women, but it's far more common in women. Substantial support for breast cancer awareness and research funding has helped create advances in the diagnosis and treatment of breast cancer. Breast cancer survival rates have increased, and the number of deaths associated with this disease is steadily declining, largely due to factors such as earlier detection, a new personalized approach to treatment and a better understanding of the disease. Glycation (sometimes called non-enzymatic glycosylation) is the covalent attachment of a sugar to a protein or lipid. Typical sugars that participate in glycation are glucose, fructose, or their derivatives. Glycation is a biomarker for diabetes and is implicated in some diseases and in aging. Glycation end products are believed to play a causative role in the vascular complications of diabetes mellitus. In contrast with glycation, glycosylation is the enzyme-mediated ATP-dependent attachment of sugars to protein or lipid. Glycosylation occurs at defined sites on the target molecule. It is a common form of post-translational modification of proteins and is required for the functioning of the mature protein. Glycation is the non-enzymatic interaction of carbohydrates with proteins. It is considered as a factor that leads to Alzheimer's disease, diabetes, aging, neuropathy, cancer, and atherosclerosis. In vitro and in vivo glycation was studied with human and bovine serum albumin as a model of the protein. A concentration of 0.1 M glucose was used as a glycation agent. The level of the Amadori product was determined by thiobarbituric acid calorimetric assay after hydrolysis. Advanced glycation end products (AGEPs) were measured by UV visible spectrophotometry. Different concentrations of ascorbic acid (vitamin C) and cinnamic acid were found to be potent inhibitors of both the subsequent end products and the glycation reaction. The result showed that, the level of glycation in breast cancer patient is significantly high and ascorbic and cinnamic acids as inhibitors decreased the

glycation reaction of albumin. Cinnamic acids play key roles in the formation of other more complex phenolic compounds. The cinnamic acids are rarely present in uncombined forms, occurring primarily as esters of quinic acid, but may also be esterified to malic or tartaric acids, or sugars. Chlorogenic acid (5-caffeoylquinic acid) is perhaps the most important cinnamic acid observed in fruits, contributing 25% of the dry weight of the bilberry (*Vaccinium*) fruit. Chlorogenic acid can be isolated from green coffee beans, and forms a black compound with iron, believed to be responsible for the blackening of cut or cooked potatoes. Anthocyanin and flavonoid glycosides are also acylated by cinnamic acids through sugar hydroxyl groups, with p-coumaric acid the most common acylating agent. In addition to forming esters, hydroxylated cinnamic acids also form glycosides with sugars. Ascorbic acid (vitamin C) is used to prevent or treat low levels of vitamin C in people who do not get enough of the vitamin from their diets. Most people who eat a normal diet do not need extra ascorbic acid. Low levels of vitamin C can result in a condition called scurvy. Scurvy may cause symptoms such as rash, muscle weakness, joint pain, tiredness, or tooth loss. Vitamin C plays an important role in the body. It is needed to maintain the health of skin, cartilage, teeth, bone, and blood vessels. It is also used to protect your body's cells from damage. It is known as an antioxidant. Diarrhea, nausea, vomiting, abdominal cramps/pain, or heartburn may occur. If any of these effects persist or worsen, tell your doctor or pharmacist promptly. If your doctor has directed you to use this vitamin, remember that he or she has judged that the benefit to you is greater than the risk of side effects. Many people using this vitamin do not have serious side effects. A very serious allergic reaction to this drug is rare. However, seek immediate medical attention if you notice any symptoms of a serious allergic reaction, including: rash, itching/swelling (especially of the face/tongue/throat), severe dizziness, trouble breathing. This is not a complete list of possible side effects. Many are to be studied.