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### Croctetin, N-acetylcysteine and their combination with glycine prevent diabetes complication due to the induction of glyoxalase system in diabetic-atherosclerotic rats

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#### Abstract

**Background and Aim :** Protein glycation is known as the most significant cause of diabetes complications. The prevention or reduction of glycation products suggested as a target for prevention and delay of diabetes complications. The glyoxalase system, composed of glyoxalase-I & II is the main enzymatic defense against glycation. In this study, the effect of croctetin (Crt), N-acetylcysteine (NAC) and their combination with glycine (Gly) was investigated on the glyoxalase system activity, diverse glycation products and the correlation of glyoxalase activity system with the levels of glycation products

**Methods:** Streptozotocin-induced diabetic rats under atherogenic diet were treated with Crt, NAC and Crt+NAC+Gly for three months. Then, glycated products (glycated albumin, glyoxal, methylglyoxal, petosidine and AGEs) and the activity of glyoxalase system in the hemolysate were measured.

**Results :** The results indicated that the mentioned treatments inhibited formation of various glycation products and induced glyoxalase system activity but the combination of Crt+NAC+Gly was the most effective. Based on these results, high negative correlation between the glyoxalase system activity and diverse glycation products was shown (0.79- 0.89, P < 0.001).

**Conclusion :** The combination of Crt+NAC+Gly showed the greatest potential of inhibition of glycation products due to the most inductive effect on glyoxalase activity system. It is suggested that the level of activity of glyoxalase system maybe a key control system of diabetes complications.

**Keywords :** Glycated Products; Misfolding; Aggregation; Diabetic Complications; Atheromatous Plaque; Rat Serum Albumin; Croctetin; Amino Acids and Streptozotocin.