SUMMARY & CONCLUSIONS
The purpose of the present studies was to investigate the antioxidant status of the diabetic subjects, differential effect of diabetogen on antioxidant status in experimental diabetes as produced by chemical agents alloxan and streptozotocin and role of vitamin C and vitamin E supplementation separately and in conjunction on diabetes related oxidative stress.

The increased levels of TBARS and low levels of major molecular antioxidants, vitamin E, vitamin C and reduced glutathione in diabetic subjects irrespective of glycaemic state and type of diabetes suggest oxidative stress in diabetes and that stress is either a consequence of diabetes or low levels of antioxidants is a risk factor and proceed to the development of diabetes.

From the results of the present study and literature cited, free radicals appears to contribute to the development of complications associated with diabetes mellitus, the use of physiological antioxidants in diet or as pharmacological preparations, along with the usual treatment i.e. oral hypoglycemic agent or insulin therapy, may prove effective in delaying the development of complications in diabetic patients. Secondly use of antioxidants in diabetes prone individuals would be useful in the primary prevention of development of diabetes mellitus as in genetically susceptible individuals environmental factors are known to contribute significantly to the development of diabetic state.
The parallelism in the observed derivations in non enzymic parameters in blood and liver and enzymic parameters in liver in alloxan and STZ diabetic rats after one week as well as after four weeks of diabetes induction indicate that the effects are primary to diabetes and are independent of development of diabetic state or both alloxan and STZ exert their diabetogenic action by the same mechanism.

The changes in individual antioxidant enzymes after one week, four weeks and six weeks of experimental diabetes indicate that initial increase in activities of enzymes is transient and the decrease in activities of enzymes after four weeks may be a direct result of enzyme inhibition due to acute toxicity resulting from hyperglycemia. In contrast, the return to normal values of certain antioxidant enzymes after six weeks indicate induction may occur after prolonged hyperglycemia as a compensatory mechanism to respond to the developing constant exposure to increased oxidative stress.

The changes in the constituents of antioxidant system, both enzymic and non enzymic in different duration of experimental diabetes indicate that all the constituents are interrelated and work in concert and the change in level of one constituent has a effect on other constituents.

The levels of antioxidants after one week of diabetes induction as studied in blood in both control and diabetic rats and after four weeks or six weeks of diabetes indicate that there is a gradual decrease in levels of antioxidants with ageing. As levels of antioxidants in a given control group also showed
a significant decline with time i.e. 4 weeks and 6 weeks.

The supplementation of vitamin C and E separately (for three weeks and five weeks) and in conjunction for five weeks had significant positive influences in improving the antioxidant status in experimental diabetes.

Vitamin E supplementation proved to be much more effective than vitamin C not only quantitatively but qualitatively also and it did not show any negative effects on studied parameters. Vitamin E was found to be more effective after four of diabetes and as the duration of diabetes increased to six weeks, the supplementation was found to have less pronounced effects.

Vitamin C supplementation had more significantly pronounced positive effects after six weeks of diabetes than after four weeks of diabetes and it had significant negative effects also after five weeks of supplementation.

Supplementation of both vitamin C and E together had additive effect on the studied parameters. There was almost a two fold increase in the antioxidant potential of vitamins in experimental diabetes when administered together. Also vitamin C and E together had negative effects on some parameters. The significant negative effects produced by vitamin C and E in conjunction could be attributed to vitamin C, as vitamin C alone also show negative effects whereas vitamin E alone had no negative effects.
In view of the results obtained with supplementation of vitamin C and vitamin E separately and in conjunction on amelioration of oxidative stress suggest that use of physiological antioxidants may prove beneficial in prevention of oxidative stress mediated diseases and in diseases related with increased stress. At the same time the negative effects produced by vitamin C and vitamin C and E together could not be ignored as both vitamin C and E are known to exert prooxidant effect.