SUMMARY

The rapidly increasing incidence of oral cancer is one of the major health challenges for scientists and clinicians. Oral cancer results from the complex interactions of multiple genetic and environmental factors. Tobacco is a major etiological factor for oral cancer development since tobacco consumption leads to the generation of free radicals and reactive metabolic intermediates, which play a significant role in carcinogenesis. Normal living cells counteract these lethal effects using antioxidant enzymes like glutathione S-transferase (GST) and glutathione reductase (GR). GSTM1, an important polymorphic form of GST, is known to catalyze the detoxification of tobacco-derived carcinogens and reactive oxygen species. Individuals with GSTM1 null genotypes would show complete absence of enzyme function and thus increase an individuals susceptibility to tobacco-induced oral cancer. Thus the study of GST and GR activities as well as *GSTM1* null genotype in oral cancer patients as compared to controls may be helpful in risk assessment and early diagnosis of oral cancer.

- The study included oral cancer patients (OCP, n=25), controls with no habit of tobacco (NHT, n=7) and controls with habit of tobacco (WHT, n=7).

- Plasma GST and GR activities were estimated by highly sensitive and specific spectrophotometric methods while the GSTM1 null genotyping was performed using the DNA extracted from white blood cells by the phenol-chloroform extraction procedure for analysis by the Polymerase Chain Reaction (PCR).

- The results obtained from the spectrophotometric and PCR analysis were:

- Plasma GST activity increased while GR activity decreased in oral cancer patients as compared to controls.
- In WHT subjects (controls and oral cancer patients), plasma GST activity increased while GR activity decreased.
- In NHT subjects (controls and oral cancer patients), both plasma GST and GR activity decreased.
- Comparison between NHT controls and WHT controls showed increased plasma GST and GR activities in WHT controls as compared to NHT controls.
- Comparison between NHT cancer patients and WHT cancer patients showed increased plasma GST and GR activities in WHT cancer patients as compared to NHT cancer patients.
- Plasma GST and GR activities decreased in cancer patients with lymphnode involvement as compared to cancer patients with no lymphnode involvement.
- Plasma GST activity increased while GR activity decreased in patients with advance stage disease as compared to patients with early stage disease.
- ROC curve analysis showed that plasma GR could significantly discriminate between controls and oral cancer patients.
- The prevalence of GSTM1 null genotype was 47.83% in oral cancer patients as compared to 25% in controls.