Antioxidant Level of Plasma in Relation with Disease Progression and Other Lifestyle Parameters in Asthma and Chronic Obstructive Pulmonary Disease (COPD) Patients

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ABSTRACT

Respiratory diorders like asthma and COPD are associated with hyper-reactivity of inflammatory and immune cells. These cells generate reactive oxygen species in the patients which further leads to oxidative stress. The present study is an attempt to study the antioxidant level in the plasma of asthmatic and COPD patients and its relation with disease progression and other lifestyle parameters like smoking and drinking habits. For the present study 52 asthmatics, 50 COPD patients and 50 healthy matched controls (with average age of 50.61±0.97, 56.12±1.08 and 45.16±1.12 respectively) were investigated. Plasma antioxidant level was analyzed using FRAP assay. Analysis of data was done using unpaired student's t-test and Pearson's correlation coefficient. The present study illustrated that the FRAP value was significantly lower ($p<0.001$) in the asthmatics (393.27±15.75) and COPD patients (366.50±15.77) as compared to healthy individuals (476.59±17.49). There was also significant difference observed in the FRAP value among the smoker asthmatics (281.27±19.38) and non-smoker asthmatics (405.18±16.40). Simillarly among COPD patients the FRAP value was significantly lower in the smokers (275.02±13.33) as compared to non-smokers (444.42±14.49) showing the adverse effect of smoking on the systemic antioxidant level in the patients. In alcohol consuming COPD patients the level of antioxidant in plasma was also found to be significantly lower (315.03±22.81) as compared to non-alcohol consumers (395.44±19.05). FRAP value in patients was found to be signifinatly negatively correlated ($p<0.01$) with duration of disease. Significant correlation was also observed between the FRAP value and severity of the disease ($p<0.01$). Value of FEV1 and FVC was found to be positively correlated with FRAP value depicting the association of FRAP with severity of the disease. This work supports the hypothesis that there is decrease in systemic antioxidant level in the asthmatic and COPD patients and it is also related to the lifestyle and progression of the disease.