POTENTIATED OXIDATIVE BURDEN AND ALTERED TRACE METAL LEVELS FROM EXCESSIVE FLUORIDE IN PATIENTS WITH CATARACT

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SUMMARY: Although high fluoride (F) exposure has been established as a factor leading to an increase in the prevalence and the severity of a numberof diseases, only a very limited number of studies have examined the association between F exposure and cataractogenesis. In the present study, we compared 155 randomly selected patients with cataract from ahigh-F region, ground water F>2.5 ppm, with age- and sex-matched control patients with cataract from a low-fluoride region, ground water F<1.5 ppm. Blood and natural lenses were collected for the assessment of oxidative stress markers, [lipid peroxide levels (LPO), protein carbonylation (PC), superoxide dismutase (SOD), catalase (CAT), andglutathione (GSH)], serum F estimations, and the measurement of trace metallevels (Cu, Zn, Se, and Fe). We observed significant ($p<0.001$) increments of LPO and PC in the high-F region subjects, as compared with the positive controls from the low-F region, in both the serum and lenses. On the other hand, the antioxidant enzyme SOD and GSH were found to be markedly ($p<0.01$) decreased in the blood and lenses of the high-F region subjects. Moreover, the concentrations of trace metals were also altered in the high-F region subjects when compared with the controls. On the basis of these results, we concluded that F ingestion may directly potentiate oxidative stress-induced cataractogenesis in high endemic fluorosis regions.

Key words: Cataract; Fluoride; India; Oxidative stress.

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