

4th International Conference on Clinical & Experimental Ophthalmology

July 14-16, 2014 DoubleTree by Hilton Baltimore-BWI Airport, USA

Fluoride intake increases oxidative burden of cataractogenesis in fluoride endemic areas in India

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High fluoride exposure is associated with prevalence and severity of eye diseases. There are limited studies showing association of fluoride and cataractogenesis. Cataract is one of the major causes of a visual impairment, which eventually leads to blindness in India and worldwide. Cross sectional study of 155 patients with cataract from the region where fluoride content was more than 2.5ppm in ground drinking water (Fluoride Endemic Area) was done. The control group with cataract was age and sex matched from the region where fluoride content was less than 1.5 ppm in their ground drinking water. Blood and crystalline lens were collected during cataract surgery for the assessment of oxidative stress marker namely; lipid peroxide levels (LPO), protein carbonylation (PC), superoxide dismutase (SOD), catalase (CAT) and glutathione (GSH) content and fluoride and Vitamin A estimations were done in serum. We observed significant ($p < 0.001$) increase of LPO and PC in study patients as compared to the control group in both serum and crystalline lens. On the other hand, antioxidant enzymes SOD and GSH were found to be markedly ($p < 0.01$) decreased in study patients. Serum Fluoride was increased significantly ($p < 0.001$) in patients residing in endemic area. Change in Vitamin A concentration was insignificant ($p > 0.05$). We conclude that fluoride ingestion may directly influence the cataractogenesis by increased oxidative burden in people residing in fluoride endemic regions in rural India.

Biography

Swati Tomar is Associate Professor in Department of Ophthalmology, NIMS Medical College & Hospital, NIMS University, Jaipur, India. She has done her fellowship in Cornea from LV Prasad Eye Institute, Hyderabad and is Medical Director of Eye Bank Society of Rajasthan (community eye bank), India since 8 years post fellowship. She is working in a Tertiary Care Centre located in Rural India and has vast experience in treating corneal diseases and doing corneal transplants. She has been a guest speaker at National and International Conferences and has many awards to her credit. Her current area of research is Eye disease prevalence in Fluoride Endemic area.

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