

CARCINOGENICITY OF FLUORIDE ESTIMATED BY THE LEVEL OF PLASMA FLUORINE FOLLOWING THE INGESTION OF FLUORIDATED DENTIFRICE AND MOUTHRINSE SOLUTION

Kenji Akiniwa,^{a,b}Kenichi Narita^{b,c}
Japan

SUMMARY: Although generally aware that dental fluorosis may follow the use of fluoridated dentifrices and mouthrinses, few researchers appreciate the general toxicity of fluoride including its capacity to cause cancer. Kosei Takahashi, MD, a past president of The Japanese Society for Fluoride Research, analysed water fluoride and cancer incidence rates in 2001 (Takahashi K, Akiniwa K, Narita K. Regression analysis of cancer incidence rates and water fluoride in the U.S.A. based on IACR/IARC (WHO) data (1978–1992). International Agency for Research on Cancer. *J Epidemiology* 2001; 11: 170-9). We found that the plasma fluorine level induced by the ingestion of fluoride, from fluoridated dentifrice and mouthrinse, showed a peak after 30 minutes followed by an exponential decrease and differed from the stable level observed in persons using fluoridated water at 1 ppm and contaminated food. The former pattern of plasma fluoride level had two components: an averaged level (after normalization by logarithmic transformation during 24 hr) and a peak value. The first indicator showed a positive regression to the ingested dose of fluoride. From a pathophysiological viewpoint, the estimated plasma fluorine level from ingested fluoridated dentifrice and mouthrinse were separately compared to the plasma fluorine in persons residing in an area with a water fluoride level of 1 ppm. The α (alpha) ratio of the two fluorine levels ranged from 1.35 to 4.25. Although Hoover, in the 1991 Surveillance, Epidemiology and End Results (SEER) Program, National Cancer Institute, did not find a significant difference in the observed/expected (O/E) cancer prevalence rates between the fluoridated and non-fluoridated areas, we found a significant effect (Review of fluoride: benefits and risks. Washington, DC: Department of Health and Human Services; 1991). In young persons, for a series of five random samples of the O/E cancer prevalence rates for osteosarcoma and cancers of the oral cavity, larynx, lung, and the uterine cervix, we found a significant increase in the 95% confidence interval which excluded 1.0 after normalization by logarithmic transformation or by Smirnov's rejection test.

Key words: Cancer; Cervical cancer; Estimated fluoride toxicity; Fluoride toxicity; Laryngeal cancer; Lung cancer; Oral cavity cancer; Topical application of fluoride; Water fluoridation.

^aAkiniwa Dental Clinic, ^bJapanese Society for Fluoride Research, ^cNarita Dental Clinic. For correspondence: Kenji Akiniwa, 3-9-22 Asahimachi, Machida City, Tokyo, Japan ☎ 194-0023 ; E-mail: zvd03254@nifty.com