Fluoride concentrations in dental biofilm fluid vary across regions and are higher than in saliva

Title 15 words or less; abstract text 280 words or less.

L. Staun Larsen*[a], V. Baelum[a], L.M.A. Tenuta[b], J.A. Cury[b], A. Richards[a], B. Nyvad[a]

line.staun@odont.au.dk

[a]Department of Dentistry, Aarhus University, Aarhus, Denmark; [b]Piracicaba Dental School, University of Campinas, Piracicaba, Brazil

Institute, city, country; be consistent for all authors.

Define all abbreviations.

Aim of this study was to estimate fluoride concentrations (F) in dental biofilm fluid obtained from six regions (reg) in the oral cavity and to compare these concentrations with F-concentrations in unstimulated whole saliva. Saliva samples were collected and dental biofilm was harvested from six intra-oral regions (posterior upper and lower, left and right; anterior upper and lower) in 42 subjects (subj). Saliva and biofilm fluid were analyzed in triplicate for fluoride concentration (μM) using a fluoride ion-selective electrode, adapted for microanalysis. Multilevel mixed-effects linear regression of log F of samples showed almost no variance between replicates (repl) (biofilm σ2(repl/reg/subj) = 0.010; saliva σ2(repl/subj) = 0.020), with most of the variance found between subjects (biofilm σ2(subj) = 0.29; saliva σ2(subj) = 0.54) and between regions within subjects (biofilm σ2(reg/subj) = 0.33). The individual geometric mean (GM) of F in biofilm fluid in regions ranged from 9.4 (95% CI: [7.5–12.0]) to 16.0 (95% CI: [11.7–21.8]) μM and was 1.6–2.7 times higher than the GM in saliva (6.0 (95% CI: [4.8–7.6]) μM). Biofilm fluid F from all six regions were statistically significantly higher than the salivary F. Biofilm fluid samples from the upper anterior region had statistically significantly higher F than samples from the lower anterior region. Linear regression showed significant positive associations between biofilm fluid F from all regions and salivary F (r2 = [0.28–0.51], $p \leq 0.001$). In conclusion, fluoride concentrations in biofilm fluid vary across oral regions, being higher in the upper anterior than in the lower anterior region. Biofilm fluid fluoride concentrations are higher than salivary fluoride concentrations. The mechanisms controlling the relationship between fluoride in saliva and biofilm fluid need further investigation

Use SI units and mention the statistical test.

Provide numerical data; define the type of average value; provide and define a measure of variance.

Provide p values or other appropriate statistical measures.

Funded by ‘Torben og Alice Frimodts Fond’ and ‘Froekenerne Anna og Dagny Hjerrilds Fond til afskaffelse af dyreforsoeg i den videnskabelige forskning’.

Provide the source of funding; if there was no funding, please state: The authors received no specific funding for this work.