

Fractional urinary fluoride excretion in 1.5-3-year-old children

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Aim or Purpose: Currently, due to the lack of data a unified fractional urinary F excretion (FUFE) of 45% is used for all children under 7 yo to assess F intake based on urinary fluoride excretion; the study aimed to investigate FUFE in young children under conditions of varying total daily F intake (TDFI).

Materials and Methods: The study recruited 15 children residing in an institution aged 1.5-3.0 years. The material was collected during six two-week periods with different TDFIs: regular and supplemented with table salt with [F] = 150, 200, 250, 300 or 350 mg/kg (in compliance with local regulations). TDFI was assessed through the calculation method of ingested water, food, F-salt and Ftoothpaste; the data was obtained through observation. Daily urinary F excretion (DUFE) was assessed through F analysis of 24-hour urine samples using a F-ion-selective electrode. The data were classified into three groups according to children's TDFI level: 1) 0.050-0.149 mgF/kg; 2) 0.150-0.223 mgF/kg; 3) 0.224-0.300 mgF/kg. FUFE was calculated as the ratio between DUFE and TDFI. For statistical analysis, Wilcoxon's t-test was used.

Results: In group 1, children had $DUFE \pm SD = 312 \pm 187 \mu gF$, in group 2 – $512 \pm 162 \mu gF$, in group 3 – $501 \pm 185 \mu gF$. FUFE was 0.23 ± 0.03 ; 0.21 ± 0.07 and 0.16 ± 0.06 , respectively ($p > 0.05$).

Conclusions: In 1.5-3-year-old children FUFE approaches 23% with a TDFI close to optimal and decreases with a higher TDFI. This is important to consider when calculating TDFI based on FUFE to avoid underestimating the risk of iatrogenic fluorosis