

On caries prevalence and school-based fluoride programmes in Swedish adolescents

January 2005 · Swedish dental journal. Supplement 178(178):11-75 Source · [PubMed](#)

Authors: [Ulla Moberg Sköld](#) [University of Gothenburg](#)

Abstract

Dental caries on approximal tooth surfaces in adolescents is still a problem in Sweden, as well as in many other industrialised countries. The aims of the present thesis were therefore: 1) to study whether caries prevalence is underestimated, 2) to evaluate the effect of cessation of fluoride mouth rinse (FMR) programme in schoolchildren with low caries prevalence, and 3) to reconsider the school as an arena for population-based fluoride (F) varnish and FMR programmes in order to minimise caries development in 13-16-year-olds. Paper I and II showed that the adolescents' own dentists consistently registered less caries compared to the recordings made by calibrated dentists from outside. Based on 420 16-year-olds at 12 different dental clinics in two neighbouring counties in Sweden, the differences were statistically significant at 10 of the 12 clinics when caries prevalence both was high in 1984 (Paper I) and somewhat lower in 1987 and 1990 (Paper II). About 80% of all approximal caries lesions were enamel lesions and are therefore not reported to the Swedish authorities, as only dentin lesions and fillings are currently included in the official caries data. The basis for Paper III was that ① many counties in Sweden abandoned school-based FMR programmes in the mid-late 1980s, as the official caries data revealed low caries prevalence among children. ② The cessation of FMR for 3 years for a group of 13-16-year-old adolescents (n=60) with low caries prevalence did not reveal any statistically significant differences in new caries lesions and fillings or in the progression of existing enamel lesions compared to a group of 13-16-year-olds (n=60) who continued to rinse for 3 years. Nor did a supplementary cross-sectional study reveal any differences in caries prevalence among adolescents who had or had not taken part in FMR programmes for the last 3 years. In Papers IV and V, new models for school-based F treatment were evaluated in two 3-year randomised controlled trials (RCT studies). Fluoride varnish (Duraphat) treatment, carried out at school by specially trained dental nurses using a simple mobile unit, among 854 13-16-year-olds from low, medium and high caries risk areas showed that the control groups developed more caries than the varnish groups (Paper IV). The largest difference was found in the high-risk area. The prevented fraction (PF) with approximal enamel lesions as the diagnostic threshold was 69% in high, 66% in medium and 20% in low risk areas for F varnish applied twice a year at six-month intervals. Supervised school-based FMR among 788 13-16-year-olds with low to moderate caries risk (Paper V) showed that FMR on the first three and the last three school days during the school term, i.e. 12 rinses/year, had a PF of 59%. Enamel lesions constituted > 90% of the new approximal caries lesions in both Papers IV and V. The main conclusions from this thesis are: (1) that enamel caries lesions on approximal surfaces should be included in epidemiological caries data in order to show true caries prevalence, (2) that the cessation of weekly FMR for 3 years did not lead to a statistically significant increase in caries incidence in a relatively small group of adolescents with low caries prevalence, and (3) that the school should be reconsidered as an arena for new models for population-based F school programmes. Fluoride varnish treatment twice a year at six-month intervals in medium and high caries risk areas, as well as supervised FMR on the first and the last three school days during the school term in low and medium caries risk areas, are excellent caries prevention strategies for approximal surfaces in adolescents at the caries risk ages of 13-16 years, as a supplement to dental home care and preventive efforts at dental clinics.

① 1980年代半ばから後半にかけて、スウェーデンの多くの郡が、学校ベースのFMRプログラム（学校でのフッ化物洗口）を放棄した。

② う蝕有病率の低い13歳から16歳の青年集団に対する学校フッ化物洗口の3年間の中止は、

学校でのフッ化物洗口を3年間続けた集団と比べて、新しいう蝕病変や詰め物、既存のエナメル質病変の

進行に統計学的に優位な差を示さなかった。

2024年4月3日 厚生労働委員会 立憲民主党 堤かなめ
出典「*Swedish Dental Journal*」2005年1月
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