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Water fluoridation confers modest benefit to children's dental health, study finds

Jacqui Wise

Adding fluoride to drinking water supplies produces a modest reduction in dental caries, according to a seven year government funded study.[1]

The benefits are, however, smaller than shown in previous studies, carried out 50 years ago before fluoride toothpaste became widely available.

Nevertheless, the researchers argue in *Public Health Research* that because tooth decay occurs disproportionately among disadvantaged communities it should be considered alongside other more targeted measures.

The results will add to the ongoing debate surrounding water fluoridation schemes. The Health and Care Bill, currently going through parliament, sets out changes to the water fluoride legislation in England.[2] If it becomes law, the bill will allow the secretary of state, instead of local authorities, to establish new water fluoridation schemes or to vary or terminate existing ones in England.

The Catfish study compared the dental health of two cohorts of young children in west Cumbria, where water fluoridation was reintroduced in 2013, and the rest of Cumbria where no such scheme exists. A total of 1444 children were in the younger cohort and 1192 in the older cohort.

In west Cumbria the younger cohort of children were born after water fluoridation was introduced and so had the full effect of water fluoridation, including exposure in utero. The older cohort was aged around 5 when fluoride was reintroduced into the water supply.

Dental teams carried out examinations on the children at regular intervals and took images of their teeth which were blinded to the fluoridation status of each participant. They also collected information about the children's diet, brushing habits, and dental attendance.

In the younger cohort, 17.4% of the children in fluoridated areas had decayed, filled, or missing milk teeth compared with 21.4% of children in non-fluoridated areas (adjusted odds ratio 0.74, 95% confidence interval 0.56 to 0.98).

For the older school cohort, 19.1% of the children in fluoridated areas had dental caries compared with 21.9% of children in non-fluoridated areas. However, this difference was not found to be statistically significant after adjusting for confounding factors.

Over the past 40 years the proportion of children with dental caries has fallen dramatically from around 72% in 1972 to around 23% in 2019.[3]

Michaela Goodwin, from the University of Manchester dental school and senior investigator, said, "While water fluoridation is likely to be cost effective and has demonstrated an improvement in oral health it should be carefully considered along with other options, particularly as the disease becomes concentrated in particular groups."

She added that tooth decay is not trivial. "The extraction of children's teeth under general anaesthetic is risky to the child and is the most common reason for children between the ages of 5 and 9 to have a general anaesthetic. Decayed teeth are painful and can impact sleep patterns, learning, attention, and many aspects of general health."

Water fluoridation is a highly contentious matter and there have been no new schemes in the UK since the late 1970s. Less than 10% of the UK population receive fluoridated water. Fluoridation schemes currently exist in and around Birmingham, Crewe, Lincoln and Scunthorpe, Newcastle upon Tyne, and Workington.

In 2021 the UK's four chief medical officers made a joint statement which described tooth decay as "an entrenched inequality which needs to be tackled." They said that water fluoridation can help narrow differences in dental health between more and less deprived communities and has its greatest positive effect in children who do not get fluoride through regular tooth brushing or dental interventions.[4]

1 Goodwin M, Emsley R, Kelly M, et al. Evaluation of water fluoridation scheme in Cumbria: the Catfish prospective longitudinal cohort study. Public Health Research. 2022. https://www.journalslibrary.nihr.ac.uk/phr/SHMX1584/#/abstractdoi: DOI:10.3310/SHMX1584.

2 www.gov.uk/government/consultations/water-fluoridation-seeking-views-on-future-consultation-process/water-fluoridation-seeking-views-on-future-consultation-process

3 Murray JJ, Vernazza CR, Holmes RD. Forty years of national surveys: An overview of children's dental health from 1973-2013. *Br Dent J* 2015;219:-5. doi: 10.1038/sj.bdj.2015.723 pmid: 26404992

4 Kmietowicz Z. Sixty seconds on . . . water fluoridation. *BMJ* 2021;374:. doi: 10.1136/bmj.n2359 pmid: 34561240