

# High levels of lithium in tap water linked to lowered rates of dementia

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(Medical Xpress)—A team of researchers from several institutions in Denmark has found what appears to be a link between the amount of lithium naturally present in tap water and dementia in the people that drink it. In their paper published in *JAMA Psychiatry*, the group describes how they tested tap water that reached approximately 800,000 people in Denmark and compared it with dementia rates to see if there might be any connection between the two. John McGrath with the University of Queensland and Michael Berk with Deakin University, both in Australia, offer an editorial piece in the same journal issue describing the work done by the team in Denmark and the possibility of adding lithium to drinking water to lower dementia rates.

Lithium is well known as a medication for people with bipolar disorder—it has also shown promise as a possible delay mechanism for Alzheimer's disease. Some have suggested it might also slow the progression of dementia in some people. It was this latter case that interested McGrath and Berk. They wondered if the amounts of [lithium](#) naturally present in [drinking water](#) have an impact on the

people that drink it. To learn more about that possibility, they tested water samples from water treatment facilities in 151 areas in Denmark. They then compared medical records of the people living in those same areas to see if there might be a connection between levels of lithium ingestion and dementia cases.

The researchers found that there were lower rates of dementia in areas where there were higher levels of lithium in the drinking water. They also found that there were higher rates of dementia in areas where there were medium levels of lithium in the water. This, the researchers contend, suggests that consuming high amounts of lithium on a regular basis might ward off the onset of dementia, though they also acknowledge that there could be other factors at play influencing [dementia](#) progression rates for the people they studied. The group also assumed that all or most of the people living in the areas tested actually drank [water](#) from their tap on a regular basis and presumably drank an average amount of it when they did so.

**More information:** Association of Lithium in Drinking Water With the Incidence of Dementia, *JAMA Psychiatry*. Published online August 23, 2017. [DOI: 10.1001/jamapsychiatry.2017.2362](https://doi.org/10.1001/jamapsychiatry.2017.2362)

## Abstract

**Importance.** Results from animal and human studies suggest that lithium in therapeutic doses may improve learning and memory and modify the risk of developing dementia. Additional preliminary studies suggest that subtherapeutic levels, including microlevels of lithium, may influence human cognition.

**Objective.** To investigate whether the incidence of dementia in the general population covaries with long-term exposure to microlevels of lithium in drinking water.

**Design, Setting, and Participants.** This Danish nationwide, population-based, nested case-control study examined longitudinal, individual geographic

data on municipality of residence and data from drinking water measurements combined with time-specific data from all patients aged 50 to 90 years with a hospital contact with a diagnosis of dementia from January 1, 1970, through December 31, 2013, and 10 age- and sex-matched control individuals from the Danish population. The mean lithium exposure in drinking water since 1986 was estimated for all study individuals. Data analysis was performed from January 1, 1995, through December 31, 2013.

**Main Outcomes and Measures.** A diagnosis of dementia in a hospital inpatient or outpatient contact. Diagnoses of Alzheimer disease and vascular dementia were secondary outcome measures. In primary analyses, distribution of lithium exposure was compared between patients with dementia and controls.

**Results.** A total of 73 731 patients with dementia and 733 653 controls (median age, 80.3 years; interquartile range, 74.9-84.6 years; 44 760 female [60.7%] and 28 971 male [39.3%]) were included in the study. Lithium exposure was statistically significantly different between patients with a diagnosis of dementia (median, 11.5 µg/L; interquartile range, 6.5-14.9 µg/L) and controls (median, 12.2 µg/L; interquartile range, 7.3-16.0 µg/L; P

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