

## DYSPEPSIA ASSOCIATED WITH FLUORIDATED WATER

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**SUMMARY:** The case is presented of 77-year-old woman with a ten-year history of weight loss, dyspepsia, and gastric ulcer resistant to medical management. Within two weeks after she began using a reverse osmosis (RO) unit on her municipal fluoridated (0.85–1.0 ppm F) drinking water source and, without further medication, the patient gained almost full recovery. In 2007, at age 87, while still continuing to use the RO water for drinking and cooking, she remained well and described the improvement in her health as being “just a miracle.” Fluoride in drinking water, at the levels commonly used in water fluoridation, may produce chronic ill health with dyspepsia.

Keywords: Dunedin, NZ; Dyspepsia; Fluoridated water; Gastric distress; Weight loss.

### INTRODUCTION

In 1937 Roholm noted that acute but transitory gastric symptoms often followed ingestion of fluoride-containing cryolite dust ( $\text{Na}_3\text{AlF}_6$ ).<sup>1</sup> Feltman and Kosel found, in 1956 and 1961, that 1% of a study population of 601 women and 495 children reacted adversely with gastrointestinal symptoms, including epigastric distress, to tablets containing fluoride in a dose of 1 mg daily. While the patients were blind to the nature of the tablets being given, the symptoms disappeared when placebo tablets were substituted and recurred when the fluoride tablets were reintroduced.<sup>2,3</sup> Czerwinski and Lankosz, in 1977, reported that “gastric ulcer” was present in 7 (12%) of 60 retired aluminium workers,<sup>4</sup> and in 1978 Waldbott et al. described a “chronic fluoride toxicity syndrome” with gastrointestinal disturbances.<sup>5</sup> Moolenburgh reported that the first patient he saw in Holland with fluoride toxicity was a 14-year-old girl who developed colicky abdominal pain with fluoridated water so severe as to suggest acute appendicitis. Her condition did not respond to medication but cleared up with stopping the use of fluoridated water and returned on a rechallenge.<sup>6</sup> His research group found that certain individuals were intolerant to fluoride and that exposure to it on a double-blind basis could result in gastrointestinal symptoms as well as stomatitis, joint pains, polydipsia, headaches, and visual disturbances.<sup>7</sup>

Independently, Petraborg described a wide spectrum of symptoms in persons exposed to fluoridated water including extreme chronic fatigue, polydipsia, general pruritus, headaches, and gastrointestinal symptoms.<sup>8</sup> Likewise, Susheela et al. found that gastrointestinal discomfort, in the form of dyspepsia, was an important diagnostic feature in identifying persons affected by fluoride and that such symptoms should not be dismissed as non-specific.<sup>9–11</sup> Some individuals become ill with fluoride at the levels used in fluoridated water.<sup>12,13</sup>

Here an illustrative case report is presented.

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## CASE REPORT

In 1997, a 77-year-old woman, a life-long resident of Dunedin, New Zealand, presented to me with a ten-year history of dyspepsia and weight loss since 1987, poorly controlled with medication. When, in 1997, after she began using a reverse osmosis (RO) unit that removes 90-95% of the fluoride in drinking water, she experienced lasting relief from her symptoms and gradually regained lost weight. The public water supply she had been drinking began to be fluoridated with sodium fluorosilicate in 1967 to increase the fluoride content from the natural level of 0.1 ppm to 1 ppm. This level was reduced in July 1992 to 0.85 ppm F.

On 19 September 1989, gastroscopy showed an 8-mm, moderately deep ulcer in the stomach at the junction of the body (or corpus, the main central section) and the antrum (or pylorus, the lower section of the organ that facilitates emptying the contents into the small intestine), and the histology of a stomach biopsy showed an ulcer base, chronic active gastritis, and intestinal metaplasia. No diagnostic abnormality was recognized in the duodenum, and no evidence of malignancy or campylobacter pylori could be detected. A further gastroscopy on 14 November 1989, after two months treatment with sucralfate, showed a persistent but much smaller ulcer measuring about 3 mm across. The histology was again of severe chronic active gastritis of the antrum of the stomach, and this time campylobacter was identified. She found, however, that she obtained only temporary relief from treatment with sucralfate and antacids. For many years her activities were restricted by abdominal pain, and she subsisted mainly on plain yoghurt. At mealtime, she could eat only about 4 tablespoonfuls of food and could not tolerate foods like vegetables. She drank 4 cups of tea daily and used fluoridated toothpaste.

Aware of my interest in the adverse effects of fluoridation from letters I had written to the local newspaper, she contacted me to ask my advice about an appropriate way to remove fluoride from the water. Because home-use RO systems are expensive (about NZ\$400), I advised her to hold off buying one and offered to supply her with RO water from my own unit as a trial. Within about two weeks, her symptoms remitted, and she subsequently purchased her own home RO unit that was attached to the tap on the kitchen sink. At the same time, she was able to cease using antacid and sucralfate medication and experienced lasting improvement in her health. The absence of current gastrointestinal symptoms was recorded in 2000 during a 3-day hospital admission for an episode of feeling faint with low blood pressure on standing (postural hypotension).

At follow-up after 10 years, in 2007, she remained well at age 87 and still used RO water, which she credited for her wellbeing. She said that the RO water had been “like magic” to her and the improvement in her health had been “just a miracle.” She was able to eat everything she wished to and had gained 6.4 kg. Her tea consumption and use of fluoridated toothpaste were unchanged. She had not noticed any return of symptoms with the occasional consumption of high fluoride foods such as sardines. She also noted the remission of arthritis that she previously had in her back, shoulders, and her right temporomandibular joint.

## DISCUSSION

No rechallenge tests were done to establish definitively that the fluoridated water played an aetiological role in the dyspepsia. However, there is a close temporal relationship between her changing to RO water and the commencement of a lasting improvement. While it is not possible to rule out her improvement being due to the removal of other contaminants such as chlorination by-products from the tap water, the clinical pattern is consistent with work relating fluoride toxicity to dyspepsia.<sup>1-13</sup>

A psychosomatic explanation for the occurrence of gastrointestinal symptoms with fluoridated water is not supported by the occurrence of symptoms in a double-blind setting in humans and their occurrence in animals such as caimans and horses.<sup>2,3,7</sup> Krook and Justus found that an early sign of fluoride intoxication in horses was the regular occurrence of colic and that it ceased with the termination of fluoridation of their drinking water.<sup>14-15</sup> Burgstahler et al. relate how caimans and alligators developed bloated bellies and gastric distress after receiving fluoridated water.<sup>16</sup> The animals became unwell without being told that their water supply had changed, so a psychosomatic basis was unlikely.

Scanning electron microscopy studies of the stomach after the consumption of water with 1.2-3.2 ppm fluoride have shown a loss of mucus droplets and microvilli, a cracked-clay appearance of the duodenal mucosa, and desquamated epithelium in the gastric mucosa.<sup>9,11</sup> Fluoride reacts with gastric hydrochloric acid to form hydrofluoric acid in the stomach.<sup>1</sup> Owing to the presence of un-ionized HF, hydrofluoric acid has tissue-penetrating and corrosive properties that can cause inflammation, petechiae, ulceration and other mucosal abnormalities in the stomach and proximal small intestine. Dyspepsia may arise with fluoride disturbing thyroid hormone function through enzyme inhibition.<sup>2,3,17-18</sup>

In conclusion, there is little doubt that fluoride in drinking water, at the levels used in fluoridation of about 0.85–1.0 ppm, may produce chronic ill health with dyspepsia.

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