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Fluoride contamination: A threat to future generations

By Keya Acharya

Over-exploitation of groundwater has resulted in surfacing of arsenic, fluoride and nitrates from rock sources.

A deepening health issue in India, newly-emerging as an endemic problem and one that concerns disability in children and women in the main, has been found to have an even more startling link to what is basically an environmental problem: that of fluoride-contaminated drinking water systems. And even more urgent, is the link that this health problem has with India's groundwater and her future populations.

The Delhi-based Fluorosis Research and Rural Development Foundation, (FRRDF) founded by a past professor of the All India Institute of Medical Sciences at Delhi, Dr A K Susheela, has come up with a startling relationship between fluorosis, the disease stemming from high fluoride contamination, and anaemia in pregnant women.

Dr Susheela, who presented her data from several low-socioeconomic communities in and around Delhi at an international conference by WaterAid-India recently, says she was struck by the number of deformed children in fluorosis-endemic urban slums and rural villages she visited over the years. No one could explain why there were so many deformed children in the community.

FRRDF tested pregnant women and found a direct co-relation between low haemoglobin levels, or anaemia, and high urinary fluoride. On further enquiry, the fluoride-contamination was traced to groundwater drawn through handpumps in the area. FRRDF also found that withdrawing the source of contamination caused haemoglobin levels to steadily increase. (The national guideline for fluoride-intake is 1.0 milligrams per litre).

The further problem with this fluoride-induced anaemia is that the latter anyway produces low birth-weight babies who in their turn manifest their mother's pre-natal nutritional deficiencies through retarded physical and mental development.

Fluorosis is now endemic in 20 of India's states and UTs, with 70-100 per cent districts affected in Andhra Pradesh, Gujarat and Rajasthan, 40-70 per cent of districts affected in Karnataka, Tamil Nadu, Maharashtra, Delhi, Haryana, Jharkhand, Madhya Pradesh, Orissa and Uttar Pradesh. Assam, Jammu and Kashmir, Kerala, Chhatisgarh and West Bengal have between 10-40 per cent of their districts affected with fluoride-contamination.

The Union ministry of health and family welfare, while not having any direct programme on fluorosis-control, has however been aware of anaemic pregnancies since the early 1970s, intervening with supplying iron and folic acid tablets to pregnant mothers at antenatal clinics, strengthening the dose in later years.

"There is still no improvement," says Dr Susheela. "The reason for this is fluorosis, a newly-emerging cause which is not being addressed by the government."

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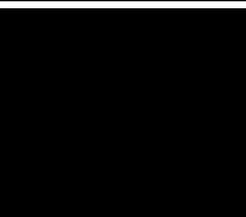
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Fluoride contamination, says Susheela, damages the hairy lining of the intestines, called microvilli, which then do not allow the absorption of the iron supplements these women are taking.

Dr Vikas Desai, Gujarat's additional director of family welfare, says low calcium-intake also facilitates fluoride-toxicity, while Susheela emphasises that many fluoride-poisoned (and physically and mentally retarded children) are mistaken for iodine-deficiency, wherein the thyroid hormone deficiency is secondary.

Bharat Lal, director of Rajiv Gandhi National Drinking Water Mission and the department of drinking-water supply says that the issue of water-quality has been secondary to providing access to drinking water for all.

"We are not monitoring the impact of the water, once access has been achieved," admits Lal, also pointing to the serious lack of trained staff to check fluorosis.

Apart from FRRD and four laboratories countrywide, Gujarat set up testing facilities in zonal medical colleges in 2007, tackling district-level training this year.

Mitigation sometimes can be as simple and cost-effective as diluting contaminated drinking water with rainwater, says Dr Samir Dutta, head of Paediatric Dentistry at Haryana's Postgraduate Institute of Medical Sciences. Dutta, who aided a UNICEF project on dilution of fluoride-affected water in Madhya Pradesh, says their survey of 2,000 affected children in 19 schools showed remarkable improvement.

Fluoride-contamination is also stemming in many cases from urban fast foods with rock salt, (kala namak, black salt) which contains 157 ppm (parts per million) of fluoride. Thus there are alarm flags around over-consumption of bhelपुरi, panipuri, chaats and the like.

The bottom-line however, remains an environmental one, from over-exploitation of groundwater resulting in surfacing of arsenic, fluoride and nitrates from rock sources.

"In a situation where fluoride-toxicity is now widespread, we are exploiting groundwater even more. And ultimately it is "health" (health department) that has to deal with the outcome of an essentially environmental problem," says Desai.

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