



Hypertension Connect to Fluoride

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Abstract

The biggest killer in India is hypertension. Hypertension increases with age. Only in 65+ age group, men and women suffer in equal numbers. One fails to understand what needs to be done to reduce high BP to 120/80 in vast majority of the population. Reveals young and old across the globe are victims of high BP. Young adults 18 years and above, 30% have high BP, according to the Cardiology Society of India survey conducted in 2015. Young adults 20 to 40 years of age in India 22% have high BP. Hypertension increases with age. Only in 65+ age group, men and women suffer in equal numbers. BP measurement in an individual give two numbers, 130/80 (Systolic/Diastolic) that assist a physician to treat the patient. Harsh Vardhan, India's Health Minister stated in a recent report, 75 million Indians above 60 years of age suffer from chronic diseases.

Keywords: Hypertension; Fluoride; Hemoglobin; Chronic diseases

Introduction

The biggest killer in India is hypertension. It is popularly known to be a life style disease. Consumption of fat and carbohydrate rich diet with high salt is fatal. Lack of exercise has adverse effects on metabolism. It is noticeable as gyms are overcrowded. Morning and evening walker's number increased in parks. In reality, the aorta and its branches supply blood to all parts of the body, the lumen through which blood flows gets narrower enhancing the pressure. In some, the vessel is blocked by fatty material. In some it is blocked by calcification of the vessel wall and constricts the lumen of the vessel. The number of blood vessels blocked may be one or more. In individuals, who have high Blood Pressure (BP) or hypertension have made efforts to control through various modes and still the relief is minimal. This is attributed to environmental factors. This communication is addressing the less known reason/or the hypertension connect to fluoride. The less known reason is a chemical, an environmental toxin, fluoride, finds its way to the body through innumerable routes viz., water, food, (which includes street food and 5 star hotel food) spices, beverages, tobacco, areca nut, churns, dental products and drugs. Fluoride not suspected, as a myth prevails that it is good for teeth. This communication provides the evidences for its adverse actions. Some are on prescription drugs to control hypertension and some on diet and exercising to burn the fat. To assess the content of fluoride consumed unknowingly and source identification through testing is of prime importance. The objective of this communication is to alert all those who are having high Blood Pressure (BP), the connect to fluoride and its management.

Review of Literature

Reveals young and old across the globe are victims of high BP. Hemant Thackere [1], a physician, and cardio-metabolic specialist from Times Group from Mumbai states 1.3 billion populations globally suffers from hypertension. He also states 1 in 4 or 5 men is a woman who suffer from hypertension. Young adults 18 years and above, 30% have high BP, according to the Cardiology Society of India survey conducted in 2015. Young adults 20 to 40 years of age in India 22% have high BP. Hypertension increases with age. Only in 65+ age group, men and women suffer in equal numbers. BP measurement in an individual give two numbers, 130/80 (Systolic/Diastolic) that assist a Physician to treat the patient. Harsh Vardhan, India's Health Minister stated in a recent report [2], 75 million Indians above 60 years of age suffer from chronic diseases. The survey is apparently India's first and world's largest study on elderly. He states ¾ of those aged 60 and above (103 million people belong to elderly group according to 2011 Census) diagnosed with chronic diseases, 77% treated for Hypertension, 74% for Chronic heart diseases and 83% Diabetes mellitus. It is a grim scenario.

In India, men and women practice yoga, exercise and meditation to reduce hypertension and other ailments. It has become a way of life. Reduced salt intake and good life style practiced by good

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Figure 1: a) The boy is spending his pocket money to buy poisonous water. **b)** The corn baked on coal, rock salt smeared is ready to eat.

number of educated people to reduce high BP. But is not making a big difference; however, one fails to understand what needs to be done to reduce high BP to 120/80 in vast majority of the population.

While addressing hypertension connects to fluoride, fluoride arising from consumption through food and beverages, as it is used as a preservative in food; it kills the bacteria and is a source. Drinking black tea has high fluoride; Tuna fish salad/sandwich has high fluoride. Statin is a fluoride containing drug administered to patients with hypertension. There are antibiotics with fluoride. Antidepressants are with fluoride. Allan aesthetics are with fluoride.

A recent article by Lou Del Bello in The Lancet on “Fluorosis an ongoing challenge for India [3]”, possibly is a revelation for the global scientific community, that fluoride ingestion is the highest through rock salt (CaF₂) with 157 ppm, (also known as Himalayan salt) when the human body can tolerate only 1.0 or 1.5 ppm, is causing serious concerns. Rock salt is very popular and consumed in the society as it has an aroma and tangy taste. It is added to food cooked at home, on the streets and hotels; added to beverages, pickles and snacks. Children get afflicted with Dental Fluorosis, by eating rock salt placed on the dining table along with salt and pepper, adding it to the palm and licking it, the whole day when they are not supervised. Addiction to rock salt is common. Lou Del Bello’s article has highlighted fluoride causes low Hemoglobin (Hb) results in anemia with devastating effects in individuals, particularly pregnant women and children in India as investigated and reported by Susheela and her school of thought [4]. Therefore, to put a stop for fluoride entry to the body is a challenge by itself. But it can be done to stop a killer disease.

Fluoride, Hypertension and Nutrition

Fluoride being an enzyme inhibitor, hormone disruptor and a neurotoxin [5-7] is seldom considered for its adverse reactions leading to diseases surfacing and its linkage to hypertension. Hypertension connects to fluoride toxicity in humans is investigated to address it.

Our earlier studies providing evidences up to the sub-cellular level and suggested fluoride causes blood vessel mineralization [8]. The concept was tested inpatients using a hospital based protocol [9]. The Physicians may need a couple of additional tests, besides the routine tests prior to prescribing the drugs to the patients for hypertension. Testing F⁻ in urine, blood and drinking water to assess fluoride intake and fluoride burden of the body is the index for suspecting high B.P. That being the case, the details are provided. Some patients may not even require drugs for treatment; diet management upon withdrawal of fluoride intake may be adequate to Reduce Systemic (SBP) and Diastolic (DBP) Blood Pressure.

To reduce Hypertension/high BP, it is essential to prevail upon a diet with high intake of fruits and vegetables upon reduced fluoride burden in the body. In this context the advice by Walter C. Willett [10], Professor of Epidemiology and Nutrition at Harvard University’s TH Chan School of Public Health and Co-chair of EAT Lancet Commission, to adopt a plant-based diet is extremely important for maintaining good health. He states almost all nutrients in meat can be obtained by consuming nutrient rich plant products except for Vitamin B [11-14]. It is our observation; the commercially available antioxidant tablets are unfortunately ineffective. But promotion of fresh fruits and vegetables rich diet with high antioxidants yields results in a shorter duration of a fortnight.

Studies on Patients with High BP/ Hypertension

Patients attending the Out Patients’ clinic in one of the reputed medical college hospitals located in town were investigated by a doctor in the Department of Medicine. Assessing BP is a routine for all patients attending the clinic. Patients with raised BP, fluoride intake were assessed by testing F⁻ in drinking water, serum and urine of the patients. A total of 125 patients (75 patients with Hypertension and 50 controls) were investigated. The mean age 53 ± 10 years; 52% males. The fluoride intake, lipid peroxidation and systemic blood pressure were assessed. A food habit score indicating level of fluoride intake was calculated using a pre-coded questionnaire. The general symptoms of the subjects were quantified to a “non-specific symptom score”. Drinking and cooking water, serum and urine fluoride levels were estimated using Fluoride Specific Electrode using an Ion Meter. Serum Malondialdehyde (MDA) and Catalase were estimated in the hospital laboratory as marker of lipid peroxidation and oxidative stress. Physiological parameters including fasting blood sugar, blood urea, serum lipids (triglyceride, total and LDL cholesterol), hemoglobin and total leukocyte count were also estimated using routine investigative procedures. The patients identified with raised BP, high fluoride in drinking water, urine and serum were introduced to two interventions. The Foundation quantified fluoride levels and shared the data with the doctor and provided appropriate guidance to the Resident Doctor for introducing the interventions to the patients.

Intervention

Diet editing: The patients interviewed for dietary habits to trace the source of fluoride intake and those items withdrawn from consumption. The focus was to withdraw consumption of fluoride in water, food and beverages and habit forming substances with rock salt with 157 ppm F⁻ [11]. Avoiding fluoride containing items from consumption, injury to cells/tissues were arrested and led to regeneration of cells. If the F⁻ content in drinking water is above 1.0 mg/L, they were shifted to safe existing source(s) from the neighborhood of their residences. The patients investigated were not

on the antihypertensive drug statin.

Intervention: Diet Counseling: Patients were encouraged to consume essential nutrients, antioxidants, vitamins, minerals through fruits and vegetables. An easy to practice protocol was set for the patients. Fruit juice from 2 or 3 fruits (freshly prepared) or cut fruits served with breakfast; salad with fruits and vegetables mixed with homemade salad dressing with olive oil for lunch and vegetable soup with 2 or 3 vegetables pressure cooked and served without butter, cream for dinner. The patients consumed 10 to 12 fruits and vegetables through breakfast, lunch and dinner every day. High intake of antioxidants and other nutrients enabled regeneration of the damages caused to the GI mucosa and absorption of nutrients raised Hb production and anemia corrected [4]. The diet prepared was for all members of the family and not patient specific. The members of the family also had a feeling of well-being with nutritive diet. The patients were informed the adverse effects of fluoride on health so that they abide by the guidelines provided for practice on a daily basis and it worked. Control group of patients were same in all respects as sample except for the difference in the control group individuals were not provided guidance to practice interventions.

Result and Conclusions

The data analysis of sample and control groups led to interesting and meaningful observations. As opposed to controls, hypertensive patients had worse food score, indicating higher fluoride consumption. The serum and urine fluoride levels were higher but not water fluoride levels. The hypertensive patients had higher MDA and lower catalase levels. In the serum there was a positive correlation between fluoride and serum MDA levels and a significant negative correlation between fluoride and catalase levels. Serum MDA showed a significant direct correlation with both systemic and diastolic blood pressure (SBP and DBP) respectively. While serum catalase showed a significant inverse correlation with SBP and DBP. Worse food score was directly correlated with SBP and DBP and non-specific symptom score.

Upon introduction to the 2 interventions, the hypertensive group within 5 weeks showed significantly greater fall in urinary fluoride levels, while change in serum fluoride level did not reach statistically significant level. There was significant fall in serum MDA and significant increase in serum catalase levels compared to control group. Dietary interventions also led to a significant fall in both SBP and DBP and a reduction in non-specific symptom score. The Hb level also improved in sample group after practicing interventions.

The studies carried out led to the conclusion that

- Hypertensive patients have high fluoride levels in body fluids and evidence of increased lipid peroxidation and oxidative stress,
- Lipid peroxidation and oxidative stress and blood pressure are linked to each other with higher F⁻ intake. Dietary interventions to withdraw fluoride intake and promotion of nutrients including antioxidants containing fruits and vegetables corrected oxidative stress and lipid peroxidation as well as reduced blood pressure within 5 weeks in hypertensive patients. Possibly the patients may not even require any drugs; diet management upon withdrawal of fluoride intake may be adequate to reduce SBP and DBP.

In Turkey an endemic nation for fluorosis, Cardiologists has

revealed valuable information. Chronic fluoride exposure on cardiovascular system in a clinical setting was their focus. It was found that the elastic properties of the ascending aorta were impaired in particular with endemic chronic Fluorosis [12]. In this study the aorta was examined directly by echocardiography and was found that fluoride can cause aortic stiffness in patients of endemic Fluorosis. In a subsequent study, it has been shown the impact of chronic fluorosis on left ventricular diastolic and global dysfunction [13].

Yet another report, Amini et al. [14] reported statistically significant positive correlation between the mean concentration of fluoride in ground water resources and prevalence of hypertension in males and females. The contributions emerged on patients with excess fluoride ingestion and on fluoride toxicity are important to take appropriate steps to curb the prevalence of hypertension/high BP. In conclusion, popularizing the message that fluoride intake through a variety of sources in daily dietary habits lead to hypertension can be effectively checked.

The public should be aware through wayside hoardings

- That rock salt is a deadly poison with 157 ppm F⁻
- All vendors selling refrigerated water by adding rock salt + lime + sugar to be informed to withdraw rock salt.
- All wayside snacks viz. golgappa, panipuri, chaat, etc. rock salt addition to be discontinued,
- Vendors selling banana on a cart on the streets should be warned not to slit the banana and add rock salt for their clients.
- The vendor selling butta (corn) baked on coal and smearing rock salt with a piece of lime should be informed that it is not good for health.
- All snacks sold in packets added with rock salt has the ingredient inscribed on the carton, the manufacturers can be informed to avoid it. Five star Hotel management to be informed to avoid use of rock salt in the preparation of gravy, soups, salads, sandwiches, etc. as it is harmful to health.

Food Safety and Standard Authority of India (FSSAI) has a major role to play. They provide the license to commercialize food products. The packets indicate the ingredients added. Rock salt addition can be traced through FSSAI endorsement on the packet. It is of paramount importance for FSSAI to act upon as they would be equally happy to reduce high B.P in the individuals/society. These novel steps would lead to reduction in fluoride consumption by the public and the burden of hypertension/high BP can be controlled.

References

1. Thackere H. Why you should let your doctor decide when to treat high BP. Times of India dated 2021.
2. Vardhan H. 75m Indians above 60 years suffer from chronic disease; survey. Times of India dated 2021.
3. Del Bello L. Fluorosis: An ongoing challenge for India. Lancet Planet Health. 2020;4(3):e94-e95.
4. Susheela AK, Kumari C. Addressing anemia in pregnant women and school children through a field tested novel strategy. Ann Natl Acad Med Sci. 2020;56:15-25.
5. Poureslami HR, Horri A, Atash R. High fluoride exposure in drinking water: effect on children's IQ, one new report. Int J Pediatr Dent. 2021;47:2011.
6. Grandjean P. Developmental fluoride neurotoxicity: An updated review.

- Environ Health. 2019;18(1):110.
7. Wang M, Liu L, Li H, Li Y, Liu H, Hou C, et al. Thyroid function, intelligence and low-moderate fluoride exposure among Chinese school-age children. *Environ Int.* 2020;134:105229.
 8. Susheela AK, Kharb P. Aortic calcification in chronic fluoride poisoning: Biochemical and electron microscopic evidence. *Exp Mol Pathol.* 1990;53(1):72-80.
 9. Kulkarni AV. To assess fluoride exposure in systemic hypertension and its effect on lipid peroxidation [M.D. thesis]. New Delhi: Maulana Azad Medical College; University of Delhi. 2010.
 10. Willett WC. Life cycle analyses shows a plant-based diet is most nutritious with least environmental impacts, *Times of India.* 2021.
 11. Analytical test report: Black Rock Salt. Tested and reported by sophisticated Instrumentation Centre for Applied Research and Testing (SICART) Department of Science and Technology, Govt. of India, New Delhi. Sardar Patel Centre for Science and Technology, Charutar Vidya Mandal, Vallabh Vidyanagar, Anand, Gujarat, India. 2008.
 12. Varol E, Akcay S, Ersoy IH, Ozaydin M, Koroglu BK, Varol S. Aortic elasticity is impaired in patients with endemic fluorosis. *Biol Trace Elem Res.* 2010;133(2):121-7.
 13. Varol E, Akcay S, Ersoy IH, Koroglu BK, Varol S. Impact of chronic fluorosis on left ventricular diastolic and global dysfunction. *Sci Total Environ.* 2010;408(11):2295-8.
 14. Amini H, Taghavi Shatri SM, Amini M, Mehrian MR, Mokhayeri Y, Yunesian M. Drinking water fluoride and blood pressure? An environmental study. *Biol Trace Elem Res.* 2011;144(1-3):157-63.