FLUOROSIS IN RAJASTHAN – TREATMENT AND PREVENTION

Fluorosis is an endemic problem in most developing countries. In Rajasthan alone all 32 districts have been identified as fluorosis prone areas. While the WHO standards permit only 1.5 mg/l as a safe limit for human consumption people in several districts in Rajasthan are consuming water with fluoride concentrations of up to 44 mg/l. This has resulted in permanent deformities, severe joint pains, general debility and misery. (Annexure 1&2)

There is a crying need to overcome the problem of fluorosis. Three approaches are indicated:
1. Treatment of the children,
2. Use of safe domestic defluoridation technique at household level.
3. Health education

1. Treatment of the disease

Literature reviewed indicated that the fluorosis is irreversible. Recent studies conducted in Rajasthan by Dr. Sunil Kr. Gupta and his team (under Rajasthan DST sponsored studies) indicated that fluorosis could be reversed, at least in children, by a therapeutic regimen (Calcium, Vitamin C and Vitamin D) which is cheap and easily available. The scientific papers have been published in International and National repute journals. (Annexure 3,4)

Recently a newly developed Tooth powder developed by Dr. Sunil Kr. Gupta is very useful in removing the dental stains of fluorosis, so as to overcome the psychological problems girls due to dental stains.

2. Use of safe domestic defluoridation technique at household level.

To avoid water containing > 1.5 mg/l of fluoride by using domestic defluoridation. Various methods of domestic defluoridation have been recommended so far, are aimed at bringing the fluoride levels to the WHO standards but they are cumbersome and difficult to use by our villagers.
Defluoridation on larger scale is costly and requires continuous skilled supervision. The commonly advisable Nalgonda process is not successful on field implementation (enclosure 5).

Newly developed KRASS defluoridation technology, Jaipur developed by Dr. Sunil Kr. Gupta appears to be most suitable for use in our rural areas. The **KRASS defluoridation technology** have been tested and approved by CSIR, New Delhi and Chief Chemist, Department of PHED, Government of Rajasthan (enclosure 6,7).

**Health education**
The further prevention of fluorosis can be done by simple health education. This requires minor changes in the diet by: (a) avoiding use of fluoride rich water, (b) use of diet rich in Calcium and Vitamin C., (c) Changing dietary habits (e.g. cooking practices which destroys Vitamin C during cooking) of the population within their social system and available resources.

The proposed strategy will be useful to overcome the problem of fluorosis and will make this program as community oriented rather than government dependant and:

"FOR THE PEOPLE AND BY THE PEOPLE"

Principal SMS Medical College, Jaipur to start a Fluoride Research Center at SMS Medical College, Jaipur in 1995, has already submitted a proposal (Annexure 8). Facilities at this center will be provided in totality to overcome the problem of fluorosis. No such center is available in our country, where the facility of treatment of, patient as well as of water is available. This center may prove to be a blessing for the population especially the younger generation living in fluoride prone areas having no choice except to drink the fluoride rich water and getting permanently deformed.
b. Fluorosis

Three aspects have been covered:

➢ Reversal of fluorosis
➢ Development of new defluoridation process (KRASS process)- Under patent
➢ Development of new tooth powder, useful to remove the dental stains- Under the process of patent

Scientific papers have been published in national and international journals, and, presented in national and international conferences.

The work on following aspects of the problem is going on:

➢ Pathophysiology of fluorosis – Detailing the details the
➢ Synergistic effects of Aluminum and fluoride resulting into aggravation of skeletal symptoms and poor scholastic performance

RECENT PUBLICATIONS

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  **Gupta S, Seth AK, Gupta A and Gavane AG**
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RAJASTHAN MEDICAL JOURNAL, (IN PRESS)

- A Process for defluoridation of water by a filter bed using indigenous material

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- Performance of a Domestic filter based on KRASS defluoridation process

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- Increased incidence of Spina bifida occulta in fluorosis prone areas

_Gupta SK, Gupta RC, Seth AK_
INDIAN PEDIATRICS, 31:1431-1432, 1994

_Letters to editor_

- Reversal of Manifestations of Fluorosis- An unusual finding

_Gupta SK, Gupta RC, Seth AK_
SDMH Jour. Vol. 16, No. 3, March 1993
CONFERENCES

Papers Presented In International Conferences

ASIAN CONFERENCE OF PEDIATRICS, NEW DELHI 1994

Two articles selected and presented in scientific session

1. Histopathological Study on Toxicological Effects of Nitrate Ingestion on Rabbits: A Possible Simulation of Nitrate Toxicity in Infants.

2. Reversal Fluorosis in Children.

FIRST INTERNATIONAL SPECIALIZED CONFERENCE ON "WATER QUALITY AND ITS MANAGEMENT" 2-6 March 1998, NEW DELHI, INDIA

One article selected and presented in scientific session

Development of New Low Cost Defluoridation Technology (KRASS)

V INTERNATIONAL CONGRESS OF TROPICAL PEDIATRICS, 1999, JAIPUR, INDIA

Three articles were selected and presented in scientific session

1. Improved Cerebral Perfusion Following Use Of "SR Compounds" In Mentally Retarded Children: A 99 Tc- Labeled HMPAO SPECT Studies Of Brain

2. Drinking Water Nitrate : A Cause Of Recurrent Diarrhea and Respiratory Infection in Children

3. Hyperparathyroidism Secondary To High Fluoride Ingestion: A Possible Pathophysiology Of Fluoride Toxicity

Papers Presented In National Conferences

Attended many national conferences and presented scientific free papers, Guest invited lectures