PREFACE

In spite of the fact that more and more people today live longer, are healthier and have more productive lives than at any time in history, yet the gains have been inadequate and uneven. At present we live in an environment, which is influenced by several factors causing its deterioration due to growth of modern industries. The extensive use of pesticides and heavy metals in the present decade are major culprits of environmental pollution. Consequently, mankind has a grim future if the same trend continues. Human beings in their living and working environment ingest, inhale and absorb many chemicals that can impose stress and trigger tissue damage by numerous biochemical and cellular mechanisms. Some such chemicals, viz. arsenic, fluoride, aluminium, mercury, nickel, chromium, lead etc. if taken beyond permissible limits are proven toxicants.

On the surface, there appears to be a trade off between meeting people’s need, which is the central goal of development, and protecting the environment. Sustainable development is the one, which lasts. A specific concern is that those who enjoy the fruits of economic development today, are making future generations worst off by excessively degrading the earth’s resources and polluting its environment.

Fluoride is an insidious poison, toxic and cumulative in its effects, even when ingested in minimal amounts. Sodium fluoride, a hazardous waste by-product from the manufacture of aluminum is a common ingredient in rat and cockroach poisons, anesthetics, hypnotics, psychiatric drugs, military nerve gases and in drinking water.
Fluoride intake beyond its permissible limit of 1 ppm is known to cause several dental and skeletal deformities leading to a crippling disease, fluorosis, where health problems occur due to consumption of fluoride contamination in water. An estimated 62.66 million people in India are affected with dental, skeletal and/or non-skeletal fluorosis in 17 out of the 32 states. Fluoride exerts a strong inhibitory action on many enzymes and body systems.

Today, arsenic poisoning is encountered through industrial exposure and water. The trivalent forms are more toxic than pentavalent forms. Heavy dose of arsenic contamination can result in death. Lower levels of arsenic may adversely affect the different tissues of the body. Oral intake has greater harmful effects and may result in the following: skin abnormalities, increased cancer risk in liver, bladder, kidney, lung and skin, decreased production of RBC but increase in white blood cells, increase in abnormal heart functions, possible impairing of nerve function and potential fetal damage during pregnancy. WHO recommended arsenic levels of 0.01 mg/liter in drinking water. The arsenic contaminated water is consumed by millions of poor villagers in parts of west Bengal, India, in Bangladesh as well as in China.

Fluoride and arsenic are found together in the form of arsenic trifluoride which is a colorless liquid and arsenic pentafluoride which is a colorless gas. Combined effects of F and As in biological systems are very contradictory and not well understood. Some studies have shown that fluoride decreases the arsenic toxicosis. Hence, the present work was undertaken for further understanding of fluoride and arsenic combined toxicity on some soft tissue structure and functions when administered alone or in combination. The
amelioration of toxicity by some antidotes viz., vitamins (C and E) and calcium phosphate were also studied.

The present study was undertaken with a view to investigate:

1. The effects of sodium fluoride (NaF) and/or arsenic trioxide (As$_2$O$_3$) on some organs of mice.
2. To study the effects of withdrawal of NaF + As$_2$O$_3$ treatment.
3. NaF + As$_2$O$_3$ withdrawal and treatment with some antidotes.

The thesis consists of Chapter I, which is general Introduction and Review of Literature. Chapter II includes the various Material and Methods employed. Charter III incorporates the Results obtained, while in Chapter IV, the results are discussed in light of previous work in the field. Chapter V has Summary and Conclusions and some future lines of work, which could be undertaken. At the end, a Bibliography in alphabetical and chronological order is given.

SEMINAR AND CONFERENCES ATTENDED/ ABSTRACTS PUBLISHED

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