

CUMULATIVE TOXICITY OF HERBOMINERAL PREPARATIONS

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ABSTRACT

Now a day's people are more prone to various kinds of toxicity in food as well as in environment. It is not mandatory that only direct intake of a poisonous materials lead to toxicity. At present scenario polluted air, water, land and the increased exposure to electromagnetic radiations through cellular phones and computers, faulty food habits, stressful life style, unpleasant feelings, continuous usage of any particular medications and even suppression of urges can act as a cause for toxicity. Cumulative toxicity is one of them mostly caused by continuous use of non purified Herbomineral preparation in our day today life. It is the adverse effect produced by the accumulated poisons and heavy metals inside the human body.

Keyword: Cumulative toxicity

INTRODUCTION

At present scenario, the living environment and the life style of people have changed a lot. Now a day's people are more prone to various kinds of poisons including slow poisons like cumulative toxicity in food as well as in environment. It is not mandatory that only direct intake of a poisonous materials lead to cumulative toxicity. Thereby the toxicity that caused due to poisoned environment has appeared in different forms and styles. At present scenario polluted air, water, land and the increased exposure to electromagnetic radiations through cellular phones and computers, faulty food habits, stressful life style, unpleasant feelings, continuous usage of any particular medications, high use of pesticides and even suppression of urges can act as a cause for cumulative toxicity. As a result cumulative toxicity is becoming more common.

Etymology: The word cumulative toxicity comprises of two words cumulative and toxicity.

Cumulative comes from the Latin word *cumulatus* for "to heap." If something is cumulative, it is heaped together so it can be counted up to get a total number. In other way we can say

- Increasing or growing by accumulation or successive additions.
- Formed by or resulting from accumulation or the addition of successive elements

Toxicity is the quality, state, or relative degree of being toxic or poisonous.

Derivation: Cumulative toxicity is the adverse effect produced by the accumulated poisons. Toxin from different sources such as food, drugs and environment may cause cumulative toxicity. This type of poison mainly depends on absorption, biotransformation and excretion of drugs. The adverse

reactions of drugs may be predictable or unpredictable. But cumulative toxicity is the predictable adverse reactions.

Any drug will cumulate in the body if the rate of administration is more than rate of elimination. That means if a drug is excreted slowly, its repeated administration may build up a sufficiently high concentration in the body to produce toxicity e.g. Digoxin, emetine and heavy metals. Substances like lead can remain deposited in bones without producing toxic effects. This is called passive cumulation. It can produce the toxic manifestations as soon as it is released into the blood.

Perspective of cumulative toxicity: Most of the Ayurvedic preparations prescribed contain herbal, minerals and metals. These preparations are believed to be fast acting and disease specific. Non purified heavy metals have been known for their toxicity. The possible heavy metal related toxicity arising from the use of herbomineral preparation is the subject of interest.

Historically there is no consensus on a scientifically validation regarding toxic effect of heavy metals used in herbomineral preparation. There is a layman tendency, unsupported by facts to assume that all the so called heavy metal and their compounds are highly toxic or have eco-toxic properties. The confusion keeps on increasing, when you find the most referred book on toxicology. All metals are present in earth's crust and enter our bodies continuously at lower levels.

The multimillion Ayurvedic drug industries are attracting so many pharmaceutical companies and thousands of products are being marketed per year. Unfortunately, none of them have given emphasis on the toxic effect of herbomineral preparation. This leads

to decrease in the projected efficacy, even though they are combination or modification of classical formulations. This may be due to following reasons:

- Improper purification of heavy metals used in herbomineral preparation
- The selected formulation may not be suitable for a specified clinical condition of that person
- Inappropriate form for the finished product
- Method of modification for a classical drug or method of preparation of new drug may be incorrect
- Failure of determining the accurate dose.

Out of the above said factors the improper purification plays a key role in developing toxicity in formulations containing mineral drugs.

The incidence of cumulative toxicity is related to the concentration of toxic chemicals in the body. In the living organism, local, systemic, short term, delayed, reversible or irreversible toxicity may be precipitated. Many chemicals are toxic because they are biotransformed into more toxic chemicals. In this situation effective measures should be taken to inhibit biotransformation, to decrease the toxicity of compound preparations.

Causes of toxicity in herbomineral preparations

- **Improper identification of crude drugs-** Ayurvedic products most commonly has multiple ingredients. Before taking any crude drug to a formulation they should properly get identified. If the drug is wrongly identified then this may lead to unwanted effects.
- **Adulteration/ substitution-** This is another serious problem associated with Ayurvedic formulation. Most of the

Ayurvedic manufacturers are purchasing the crude drugs from commercial suppliers. Some times the price of crude drug may be very high. It is here, that the profit motive commercial suppliers may increase the bulk of the drug by adding adulterants or some times entirely replacing the crude drug with some other substances.

- **Manufacturing under unhygienic conditions-** In India apart from few big companies most of the Ayurvedic manufacturers are from small scale unit. The hygienic conditions of these units are very poor. Many times the store rooms are the thriving areas of many rodents and they will make the raw material further unhygienic.
- **Lack of technically qualified persons-** like other manufacturing industries Ayurvedic manufacturing units also require technically qualified persons, unfortunately not common in India.
- **Improper quality control checks-** At least at the state level of government laboratory should be established for the exclusive testing of Ayurvedic drugs.
- **Inadequacy of the present laws-** The laws relating to manufacturing of Ayurvedic products are very weak and it enables a simple way to get license for their manufacturing. These laws should be made strict so that no product should be marketed without proper standardization.

Factors of cumulative toxicity: The cumulative toxicity is attributed to the drug due to some extrinsic and intrinsic factors.

Extrinsic factors: Pesticide residue e.g. Agrochemicals

- Fumigants e.g. Methyl bromide

- Adulteration of accidental mixing with more toxic plant

Intrinsic factors: Chemical constituents such as toxalbumin, Hydrocyanic acid, certain alkaloid, saponins, glycosides etc

Compound preparation mostly causes cumulative toxicity. The toxicity of medicines not only arises by combination but by antagonistic surroundings namely:

- Drug growth in different seasons (Kaalaviruddha)
- Discrepancies in its collection (Sampath virudha)
- Blemishes on its processing (Samskara virudha and paakaviruddha)
- Faults in dose fixation (Maatra virudha)
- Deficiency in preservation (Sampath virudha)

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