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# LACK OF NATIONAL POLICY ON ENDOCRINE DISRUPTERS AND ENVIRONMENTAL EXPOSURE, MAKING ENTIRE POPULATION VULNERABLE FOR DREADED DISEASES


**Gupta, Ajay Kumar; Kaur, Amanpreet**

Department of Biotechnology, Maharishi Markandeshwar University, Mullana (Ambala) India, Email: akgupta.in@gmail.com


## SUMMARY


From a national perspective, endocrine disrupters should be right at the top of our list of concerns. The endocrine disrupting chemicals have trespassed every vital organ our body including those which are hormonally very sensitive. Disorders of the endocrine system are near to epidemic which includes infertility, abnormal gonad development, cancers of the reproductive organs, unusual pubertal onset, diabetes, obesity, and many more. There are no such laws in the country that could prevent exposure of such EDs in the 1.2 billion population. Markets are flooded with the products those are rich in EDs and the population is obliviously getting exposed to risks from Eds in the environment. There is an urgent need to promulgate laws to save the population detrimental effects of BPA.


## INTRODUCTION

- There is growing evidence that the environmental chemicals can disrupt the normal homeostasis of body causing many disorders. These chemicals which mimic the natural hormones and interfere with the endocrine system are known as Endocrine Disrupters (EDs).
- Many synthetic chemicals have been identified which can act as endocrine disrupters. The chemicals Bisphenol A (BPA), dioxins, phthalates, polyvinyl chlorides (PVC), polychlorinated biphenyls (PCB) which are rampant impurities and used in making products that Indian population uses every day.
- Exposure to Bisphenol A is widespread and has been linked to a number of adverse health effects including breast and prostate cancer, impaired fertility, cardiovascular disorders, and insulin resistance. Disorders of the endocrine system are near to epidemic.
- Due to growing public concern over the long-term impact of exposure to BPA, especially for infants, the Governments of many countries have banned plastics containing BPA from being used in the bottles for infants and children including Canada, France, and some States of U.S., Denmark etc. Here in India, the population has no awareness about BPA.
- Local markets flooded with cheap plastic bottles widely used by masses. The laws that aim to protect us from health harm often lag behind the knowledge on the hazards.

## CURRENT STATUS OF ENVIRONMENTAL TOXICANTS IN INDIA

- The human activity is altering our environment in a huge way. So to protect the environment, the Environment (Protection) Act 1986 regulates and takes bold measures to fight the environment related problems. This environment act includes the water, air and land and the interrelationships which exists among water, air, land, and human beings and other living creatures. This act is responsible for laying down standards for the quality of environment in its various aspects. The Act prescribes a special procedure for handling hazardous substances and the concerned person has to handle the hazardous substances according to the procedure of the Act which is the Manufacture, Storage and Import of Hazardous Chemicals Rules 1989.
- Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 : This act includes all those chemicals which can cause potential harm at a certain threshold concentration during storage or industrial activity or leakage. The list includes 684 chemicals which are known to be hazardous to the living beings.
- BPA is one such chemical which tops the list of concerns for causing potential harm to humans and animals. It leaches out of plastic containers and cans into the foods and drinks that the people consume. Several studies have reported the hazardous effects of BPA, yet it is not included in the list of hazardous chemicals.
- Referring to the current status of BPA in feeding bottles, baby sippers, cups, storage containers, cans etc this BPA is not included so far. So all those which are being manufactured in India do have the high level of contamination of BPA in these products and is used by expecting mothers, infants, school kids, adults and girls and even the grownups being unaware of chemical hazard that routinely leaches out of water and packed food.
- There are great quantities of feeding bottles and nipples, water bottles, baby sippers, cups, liquid storage cans, packed foods, tetra packs etc, are imported in the country. Since other countries have banned these goods, so there is a great danger that these goods would be now routed to Indian markets. Because there is no mention of toxicity of BPA under hazardous chemicals rules, the custom imports cannot restrict their entry. The domestic manufactures of plastic bottles, containers, food packaging material also use rampantly the polycarbonate plastics and epoxy resins, from where heavy doses of BPA leach out into the drinking materials. Hence it becomes necessary to incorporate the BPA into hazardous chemicals rules 1989.

Chinese Plastic Products Flooding Indian Markets

BPA containing Water Bottles

## PRELIMINARY WORKS ON BPA

### Research done in other countries :

- Several studies have been conducted on BPA regarding its leaching into the food products and its potential health effects. The profound effects of the weak estrogenic properties of BPA were determined by conducting animal studies (Nagel et al., 1997). Calafat et al., 2005, reported that more than 90% of the U.S. population has detectable levels of BPA in urine samples. The average conc. in baby bottles in U.S. was 8.3 ng/ml while in Canada it was 7.0 ng/ml. Many other studies continue to pour results of detectable levels of BPA in bottles and canned foods and drinks.

### Research done in our laboratory :

- Research was conducted in our laboratory in Department of Biotechnology to detect the levels of BPA in various plastic bottles and cans that leaches into the food products. The work was using by collecting samples from plastic bottles and cans and analysis of BPA using UV-Visible Spectrophotometer. The more refined analysis was done using HPLC. The results of the study are shown in the table.

| Product | Conc. of BPA detected (µg/l)(taking standard as zero) |
|---|---|
| Baby Feeding Bottle | 23.3 |
| Sipping cups | 84.0 |
| Water bottle | 312.5 |
| Canned food | 138.19 |
| Plastic storage containers | 127.3 |
| Polycarbonate cold drink bottle | 77.36 |

- The above study was conducted in triplicates to verify the results. This showed that there are detectable levels of BPA in the routinely used products and how much the population is exposed to such chemicals.

## RECOMMENDATIONS

- **Ministry of Environment and Health should duly notify the toxicity of BPA throughout the country.**

  It is recommended that government should notify the hazardous effects of BPA and the wide exposure that population is experiencing with BPA. BPA may be a risk factor for a wide range of neurodegenerative diseases . Due to unawareness the whole nation's popluation is at risk.

- **BPA should be added to Hazardous Chemicals Rules list; Schedule 3.**

  The Environment (Protection) Act 1986 is responsible for laying out standards regarding environment and health. It include in its Schedule 3 the Manufacture, Storage and Import of Hazardous Chemicals Rules 1989 which includes all such chemicals which are known to cause ill effects to living beings on exposure. BPA is also one such chemical which is known to cause many disorders and this has been reported by many studies.

- **All feeding bottles, storage cans, liquid packaging containers, tiffins, water bottles, cups made from polycarbonates and epoxy resins contaminated with BPA should immediately be recalled from entire country.**

- **Ministry should issue the notification to custom import** that no such feeding bottles, nipples, sipping cups, liquid packaging containers be imported from any of country of the world and strict guidelines should be issued. Because there is no law enforced against BPA products ,they are being continuously flooded in our country. It is recommended these products should be stopped from being imported from other countries where these have been banned.

- The domestic manufactures of such products should be strictly instructed that they are no more allowed to manufacture such products those have risk of BPA contamination.

- There should be clear provisions for punishment for violating these guidelines. As these plastics are being made on cheap basis and it could be possible that their manufacturing is contiued .

- **The government should give a very wide publicity on hazardous effects of BPA.**

  Though there is no need to repeat the research on this, yet for testing the BPA in finished products, the government should designate some laboratories for product evaluation through latest techniques like LCMS etc.

## CONCLUSIONS

- A world support is needed to convince the policy making and regulatory bodies to help promulgate the laws on ED free environment.
- Timely preventive measures could be adopted for protection of vulnerable population, mostly children, from multiple and long-time exposures of EDs.
- Because world is moving towards BPA free food and water, we are also targeting our country to be BPA free.

## REFERENCES


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