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ORIGINAL ARTICLE

Impact of Toxic Chemicals in Drinking Water on Human Beings

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ABSTRACT

The determinations of the toxic metals were found in their respective work as, Cd, Mn, Hg, Ni, Zn, Cu, Fe, Pb, Cr, Co. The present era is the period of science. In every corner of life there are great and wonderful achievements due to the innovative researches going on for the benefit of human beings. But on the other side the basic need of life i.e., water, air and soil is getting contaminated by the fertilizers, heavy metals, pesticides and other toxic compounds being used and produced during scientific developments. Fresh water is very essential to perform all the vital activities of living organisms including plants and animals. The quality and quantity of fresh and potable water is decreasing day by day due to its mismanagement by human beings and the Authorities.

***Key words**: Toxic element, physicochemical, drinking water, illness*

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INTRODUCTION

Pollution in drinking water is toxic for all type of animals and humans population. The Pollution of water toxic and dangerous to human body after long periods its effects not show early stage. Many types of pollution in water like heavy metals toxins are deposits in rivers and lackes, reservoirs run off from different industries. Thus, its toxins hazardous affect in aquatic life (fish etc.) and indirectly its effects the human beings. Some elements otherwise regarded some metals are must in minimum percentage, for living beings (Abida *et al.,* 2009, Bajpai and Mishra, 1993 and Bhatnagar and Singh, 2010). Excess amount of polluted substances which cause the polluted water may be accessed through physico- chemical and microbiological characteristics (Gupta and Singh, 2010 and ISI 1993).

Potable water is a major source by which polluted particle and illness materials may enter the living being and may be cause many dangerous diseases (Ram *et al.,* 2011 and Saxena and kaur, 2003). The central nervous system (CNS) is the prompt sensitive part of body. Symptoms may include pain of brain, loss of memory irritability, abdominal pain, constipation, et. Very less amount of specific metals are assenssial to human body but it is getting very high quantity as compared the permissible limit, so it is concluded that the toxicity by metals poising in the body. Lakes, reservoirs and dams have special characteristics due to their nature and dynamics that make them to be vulnerable to pollution. They may cause decrease the immune system, failure reproductive system or dangerous mortality. Different types of hazardous toxin chemicals discharge by the large industries and agricultural areas and mix them into the water and cause the pollution. The pollute water of rivers and other water reservoir become poisonous and toxic affects to aquatic animals make ultimately death.

METHODOLOGY

The present findings are compared by adopting standard analytical techniques (Singh 2010, 2014, 2015, 2017 a, b). Water samples were analyzed to find out, Fe, As, Ni, Hg, Co, Pb, Cd, Cr, Cu Zn, Mn. The conclusions and findings compared with the standards (ISI 1993 and Singh and Jatav 2017) Cd (cadmium), Pb (lead) and Hg (Mercury) are main toxic metals to create poisonous effect in human body. Specific type of toxic metals (Co, Hg, Pb, Cd, Cr) enter the human body by the different ways (Through water specially drinking water, eating the toxic food, inhaling the metal mix materials, Eye and Skin tough or contact) and they cause enhance the oxidation stress so degenerate and damage the cells of effected body. Water samples were taken in clean fully sterilized special material bags. The any damage causes create the critical health issues (Singh 2021).

Table 1: Concentration of toxins in Drinking Water in town Deeg (Bharatpur) Rajasthan (*maximum permissible (mg/L) limit 2008, WHO)

S. No.	ARSENIC (mg/L) Maximum permissible limit (0.05)	CADMIAM (mg/L) Maximum permissible limit (0.003)	CHROMIAM (mg/L) Maximum permissible limit (0.048)	COPPER (mg/L) Maximum permissible limit (0.049)	FERROUS (mg/L) Maximum permissible limit (0.29)	LEAD (mg/L) Maximum permissible limit (0.01-.015)	COBALT (mg/L) Maximum permissible limit (0.05)	MANGNESE (mg/L) Maximum permissible limit (0.1)	NICKEL (mg/L) Maximum permissible limit (0.00)	ZINC (mg/L) Maximum permissible limit (5.00)
1	-	.010 -0.100 mg/L	-	0.020-0.12 mg/L	-	.019-.219 mg/L	-	-	-	-
2	-	.00 mg/L	.00-.02 mg/L	-	-	0.00-0.03 mg/L	-	0.10 mg/L	0.00 -0.10 mg/L	0.00 - 0.16 mg/L
3	349-923 mg/L	14-21 mg/L	89-199 mg/L	-	97-1872 mg/L	5-1203 mg/L	5-39 mg/L	24-201 mg/L	-	45-4169 mg/L
4	-	0.07-51.04 ppb	756.90-2.99 ppb	69-7.88 ppb	0.0.120 ppb	37.11-3.66 ppb	-	1.66-333- ppb	-	20.01-905.89 ppb

Table 2: Effects toxics (Heavy Metals) in potable Water on living organisms

Heavy metals	Acute exposure (usually a day or less)	Chronic exposure (often months or years)
Lead	(Brain dysfunction) Nausea, Vomiting	Nephropathy (kidney disease
Cadmium	(lung inflammation)	Proteinuria -carcinogenic effects, diseases of bones)
Chromium	Failure Gastrointestinal	Lung cancer
Arsenic	Encephalopathy, Arrhythmia, Multi-organ effects Painful, neuropathy, Nausea, Vomiting, Diarrhea	Hypo pigmentation/ Hyperkeratosis, Diabetes, Cancer

RESULTS AND DISCUSSION

Some elements are essential in trace amount for human beings, while higher concentration of these elements causes toxic effects, and some heavy metals are one of them. The findings of research samples reveal the presence of cadmium, copper and lead and their resulted were also correlated with ISI polluted levels for drinking water. The present findings of research revealed that the high concentration of lead (Pb) in drinking waters of Town Deeg (Bharatpur) Rajasthan. The range (mg/l) of of Pb traced in sample of water between the ranges of 36.71 mg/L to 3.18 mg/L, a percentage of content of pb that would have light effect on an older man may have a significant effect on a infants (Thakre *et al.* 2009 and Trivedi 1979). As the IARC, inorganic arsenic and cadmium are

classified as cancerous (European Union commission 1958). The toxic metals effects, such as heart diseases, gastrointestinal disorder, kidney and liver damage from mercury, Anemia from lead are also reported (Zarel *et al.* 2003 and Zirota *et al.* 2009).

In the present investigation, higher values of dissolved heavy metals in sample water have been recorded the intervals of period. The findings were matched prescribed standards. From analyzed samples concern with physic-chemical characteristics 298.17% for TDS and 84.01% for electrical conductivity, the samples were within the permissible pH (6.5-8.5) and all the data concern to ph within the permissible range 6.5-9.5 (Singh 2017a,b). All samples showed beyond the permissible label suggested by world health organization 2008. The highest and lowest concentration of Pb, Cd, Mn, Fe Cr, Cu and Zn, in taken water samples in average of (36.71-3.18), (72.07-14.035), (433.5-24.65) and (8295-815) (150.86-3.22), (69-8), (1691.68.5-55.0) (Table-1).

CONCLUSION

Water born diseases such as cancer anemia, heart diseases, diarrhea etc. in residents of town Deeg (table-2). Water pollution in respected area effect the physiology of the local human being in town deeg and effects on vital organs of the body and change the physiological systems (Alimentary canal, nervous system, heart, blood physiology, excretory system (kidney) and other internal organs of the concern persons. Residents of town Deeg may suffer through different types of diseases on drinking water with higher concentration of pollutants. People should beware about the hazardous effects of consumption of polluted water and related eatables. It is also essential that farmers should be educated to reduce such contamination and should be encouraged to use the controlled amount of pesticides; to avoid the leaching of waste water and cultivation should be conducted in fields far away from industrial area as well as areas prone to contamination. It is concluded that (WHO) bioaccumulation of Heavy metals may pose great hazard to health of humans and animals that rely on the water bodies.

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