

## **A Study on Awareness about Arsenic Pollution In Rural west bengal**

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**ABSTRACT:** *The word Arsenic is always alarming to us. It is nothing but a prejudiced view. If we take arsenic through drinking water or in other forms, it is not always injurious to health. It is a matter of lookout whether its intake is within or beyond the danger level. All of us should be aware of the value of danger level. The present study deals with to create consciousness among the people in respect of danger level of arsenic in drinking water, sources, impacts of arsenic pollution and to create awareness among rural people about preventive measures to arsenic pollution. The sample consist of 100(N=100) people of different families gathered by Situational Sampling Technique from different arsenic prone rural areas of Habra Block, North 24 Parganas, West Bengal, India. The findings reveals that a large portion of the areas of North 24 Parganas, is dominated by arsenic pollution and people suffer from arsenic-stricken diseases because of their ignorance and lack of awareness regarding arsenic pollution and its impact on Human Health. Some measures should be taken to generate awareness among general people from government, semi-government organizations, NGOs and other individual and collective efforts. Further studies are necessary in this regard.*

**Keywords—** *Arsenic Pollution, Water level, Disease, Rural, Habra Block, West Bengal.*

### **I. INTRODUCTION**

Today Arsenic pollution is a menace to all of us. A major part of India is affected by Arsenic pollution. Arsenic affected persons are spreading in various number in different parts of India. Specially in West Bengal this number is too high. Persons are being affected arsenic pollution in two ways namely (i) ignorance about arsenic pollution and (ii) in difference or lack of precaution about arsenic pollution.

Deep acting impact of Arsenic pollution on Human being, plants, other animals and Environment is much alarming. In different countries of the world like Mexico, Chilly, Argentina, India, Bangladesh, Myanmar, Arsenic pollution is increasing day by day. In West Bengal several district such as 24 Parganas (N & S), Nadia, Burdwan, Malda etc. are being affected very badly. For analysis and finding the preventive measures, Project on Arsenic pollution is being done.

### **II. SIGNIFICANCE OF THE STUDY**

Excessive arsenic taking causes various diseases. Symptoms of arsenic pollution in a body should be identified and measure for treatment should be taken. For prevention, first of all arsenic taking should be always below the danger level (0.05 mg/lit) and if required, arsenic free water should be supplied. This task of solving the problem may be successfully done both by the Government and Non-Government Venture and there should be coordination between them. Most of the villagers of North 24 Parganas of West Bengal are affected by arsenic pollution. The pollution problem stands in the way of their economic property because it also harms the environment which is conductive to health.

So, this type of study is required to know how much potentiality for environment development and public health are wasted by the arsenic pollution and in what way this problem can be overcome. If we are able to find out any acceptable measure for this problem then the development of this area and public health will be sustainable.

### **III. SOURSES OF ARSENIC**

Arsenic is found widely in nature and most abundantly in sulphide ores. The arsenic loaded iron particles are then flushed into the sand layer below. The layer of fine sand traps the arsenic loaded iron particles in the top few centimeters, thus affectively removing arsenic. Sources of arsenic are-

1. Some travicides and rodenticides contain arsenic.
2. Arsenic is illegally used to prepare alcohol and induce abortion.

3. Factories where copper is melted, in one step of the process, arsenic is obtained as a by product.
4. Previously in many allopathic medicines arsenic was used. This practically not used now-a-days in modern medicine.
5. In agricultural fields to kill the herbs arsenic is used.
6. In pomphred and hilsa fish arsenic is found in greater amount than in any other fish.
7. In some regions, in some layer of soil, arsenic may be there. Arsenic released through some chemical process and dissolved in the water of that layer. If the tube well pumps out water from the layer, arsenic may be present above the permissible limit.
8. High arsenic concentration in ground water is generally associated with the geochemical environments of volcanic deposits, geothermal system and being fill deposits of allured lacustrine origin.
9. The principle sources of arsenic are from arsenic bearing geologic material. The presence of sulphide mineral deposits in the field and the association of arsenic with such types of minerals suggest very strongly that these are the origin for the near field arsenic sources.
10. Factual and anecdotal reports indicate that high concentrations of arsenic are grounded primarily in the upper 150 meters of the alluvial sediments.

### **Harmful effects of arsenic**

Harmful effects of arsenic pollution has two division-

- a) Acute poisoning
- b) Chronic Poisoning

#### **a) Acute poisoning**

Acute poisoning may occur due to accidental ingestion of inorganic arsenic compounds (e.g. arsenic trioxide). Cases of poisoning are characterized by profound gastrointestinal damage, resulting in sever vomiting and diarrhea which may result in shock and subsequent oliguria and albuminuria. Other acute symptoms may occur within a few minutes following exposure to the poison in solution out may be delayed for several hours if the arsenic compound is solid form or if it is taken with a meal. When ingested as a particulate, toxicity is also dependent on solubility and particle size of the ingested compound.

The fatal dose of ingested arsenic trioxide has been reported to range from 70 to 180 mg./lit Death may occur within 24 hours but the usual course runs from 3 to 7 days. Acute intoxication with arsenic compounds is usually accompanied by anemia and leucopenia especially granulocytopenia. In survivors these effects are usually reversible within 2 or 3 weeks. Reversible enlargement of the liver is also seen in acute poisoning.

Exposure to irritant arsenic compounds in air, such as arsenic trioxide can causes acute damage to mucous membranes of the respiratory systems and can cause acute symptoms from exposed skin. Severe irritation of the nasal mucosa, larynx and bronchi as well as conjunctivitis and dermatitis occur in such cases. A certain tolerance against acute poisoning is believed to develop upon repeated exposure. This phenomenon, however, is not well documented in the scientific literature.

#### **b) Chronic Poisoning**

Chronic arsenic poisoning may occurs in worker exposed for a long time to excessive concentration of airborne arsenic compounds. Local effects in the mucous membranes of the respiratory tract and skin effects are prominent features. Involvement of the nervous and circulatory systems and the liver may also occur as well as cancer of the respiratory tract.

With long term exposure to arsenic via ingestion in food, drinking water or medications, symptoms are partly different from those after inhalation exposure. Vague abdominal symptoms – diarrhoea or constipation, flushing of the skin, pigmentation and hyperkeratosis – dominate the clinical picture.

Anaemia and leucocytopenia often occur in chronic arsenic poisoning. Liver involvement has been more commonly seen in persons exposed for a long time via oral ingestion than in those exposed via inhalation.

Arsenical skin lesions are some what different depending on the type of exposure. Eczematous symptoms of varying degrees of severity do occur. Two types of dermatological disorders may occur.

- 1) An eczematous type with erythema, swelling and papules or vesicles ; and
- 2) A follicular type with erythema and follicular swelling or follicular pustules.

Dermatitis is primarily localized on the most heavily exposed areas such as the face, back of the neck, forearms, wrists and hands. Chronic dermal lesions may occur depending on the concentration and duration of exposure. These chronic lesions may occur after many years of environmental exposure. Hyperkeratosis, warts and nekabisis of the skin and the conspicuous signs in chronic skin lesions poisoning depigmentation , i.e. Leukoderma, especially on the pigmented areas, commonly called ‘raindrop’ pigmentation also occurs. These chronic skin lesions, particularly the hyperkeratosis may develop into precancerous and cancerous lesions.

Mucous membrane lesions in chronic arsenic exposure are most classically reported as perforation of the nasal septum after inhalation exposure. This lesion is a result of irritation of the mucous membranes of the nose.

#### **IV. OBJECTIVES OF THE STUDY**

1. To study the awareness among the rural people about arsenic pollution.
2. To study the perceptions of rural people about the sources of arsenic pollution .
3. To study the awareness about the impacts of Arsenic on human body.
4. To find out the awareness among the rural people about the preventive measures to Arsenic Pollution.

#### **V. METHODOLOGY**

The sample (100 people) of aged between 20 to 80 years was collected from different arsenic prone rural areas of Habra Block, North 24 Parganas, West Bengal, India.

**Table –I:**

<b>People</b>	<b>No. of People</b>
<b>Male</b>	<b>50</b>
<b>Female</b>	<b>50</b>
<b>Total</b>	<b>100</b>

**Type of the research:** The study is basically survey type research.

**Sample :** The sample was hundred(100) people (male – 50, female – 50) of aged between 20 to 80 years of different families collected by situational sampling technique from different arsenic prone rural areas of Habra Block , North 24 Parganas, West Bengal, India.

**Tools:** An interview schedule prepared by the researcher.

#### **VI. FINDINGS AND DISCUSSION:**

**Table – II: Awareness about arsenic pollution**

<b>Awareness</b>	<b>Male (%)</b>	<b>Female (%)</b>
<b>Awareness about arsenic pollution</b>	<b>54%</b>	<b>49%</b>

Data reveals that 54% of male and 49% of female population are aware about arsenic pollution, that means 46% male and 51% female population are unaware about arsenic pollution.

**Table – III: Awareness about the sources of arsenic pollution**

<b>Awareness</b>	<b>Male (%)</b>	<b>Female (%)</b>
<b>Awareness about the sources of arsenic pollution</b>	<b>24%</b>	<b>15%</b>

Data reveals that only 24% of male and 15% of female population are aware about the sources of arsenic pollution, that means most of the male(76%) and female(85%) are unaware about the sources of arsenic pollution.

**Table – IV: Awareness about the impacts of arsenic pollution**

<b>Awareness</b>	<b>Male(%)</b>	<b>Female(%)</b>
<b>Awareness about the impacts of arsenic pollution</b>	<b>51%</b>	<b>42%</b>

Data reveals that 51% male and 42% female are aware about the impacts of arsenic pollution, that means, 49% male and 58% female are unaware about the impacts of arsenic pollution.

**Table – V: Awareness about the preventive measures to arsenic pollution.**

<b>Awareness</b>	<b>Male (%)</b>	<b>Female (%)</b>
<b>Awareness about the preventive measures to arsenic pollution.</b>	<b>37%</b>	<b>32%</b>

Data reveals that only 37% of male and 32% of female are aware about the preventive measures to arsenic pollution, that means most of the male(63%) and female(68%) are unaware about the preventive measures to arsenic pollution.

Findings indicate that a large number of people residing in Atulia, Haria, Jeoldanga, Hirapole, Anoarberia, Raghobpur, Kalitala, Simulpur, Betpul etc. Villages of Habra Block, in the Dist. North 24 Parganas, West Bengal, India are unaware about arsenic pollution, its sources, impacts and preventive measures. Findings also indicate that female people are more unaware than male people.

If the findings of the study become the general criteria of different villages of West Bengal then the coming days will be very alarming to the society.

## **V. CONCLUSION & SUGGESTION**

The study of the project reveals that a few people are aware of arsenic pollution, its sources, its impacts on the human health and its preventive measures. A large number of people are ignorant of arsenic pollution. They suffer from arsenic disease and become the victim of Arsenic pollution but they do not think of it. Most of the people in the area under survey are reluctant to the suffering from arsenic. When the impact of arsenic becomes actual and people suffer from Black foot disease then they can realize that they are suffering from arsenic pollution. When people suffer from different skin diseases, the body looks very rough, black spots are found on the hand and foot, people suffer from pain in big and liver. Some patches of blood are found on the joints and itching tendency is also found.

The problem of arsenic may be removed by adopting different measures, such as –

- i)** Creation of public awareness.
- ii)** Filtration of water.
- iii)** Use of surfaces water after boiling.
- iv)** Drinking of arsenic free water.
- v)** Testing of Drinking water at sometime interval.
- vi)** To make water arsenic free.
- vii)** Initiate by the NGOs (Non Govt. Organization).
- viii)** Govt. plans and Programmes to supply arsenic free drinking water to the rural mass.

In fine, it may be concluded that this study will be helpful to create awareness among the rural people and make them free from arsenic-stricken disease. It may also be said that general awareness created by Govt., Semi-Govt. agencies, NGOs and other individual and collective efforts is the only measure to be free from the grasp of arsenic.

## **REFERENCES**

- [1]. Chatterjee d. "Geochemistry of Arsenic in the sediments of Bengal Delta Plan".
- [2]. Das Indrani, Ghosh koushik and Sanyal S. K. of Bidhan Chandra Krishi Viswavidyalaya : "Phytoremediation of a potential option to mitigate arsenic contamination in soil-water plant system."
- [3]. Dey Madhusnata : "Oietary Protection Against Arsenic Toxicity."
- [4]. Gupta, Anirban: "Arsenic-free Safe Water – An appropriate Technology."
- [5]. Hoque, S.R.(2012), Arsenic Pollution in Rural West Bengal- Exploring Some Challenges.
- [6]. Kundu, Ashok, Rishi Bankim Chandra College : "Arsenic Free Drinking Water : The Gontra Experience."
- [7]. Prof. Chakraborty R, University of Calcutta : Impact of Awareness of Arsenic on Health and Environment among the Rural People : a case study on the villages of North 24 Parganas.
- [8]. Prof. Nath, K.J. : "The new menace in Asia is Arsenic in Ground Water and its impact on community Health."
- [9]. Poddar, D. Chakraborty, Arup and Banerjee, Tarak : "Journey Towards Reduction of sufferings of the people of West Bengal from the clutch of Arsenic."
- [10]. Roy Choudhury, A : "Arsenic exposure through drinking water creates health problem due to lack of awareness."
- [11]. Sahu Manabendra : "Alarming Arsenic Attacking Aquifers."
- [12]. Sanyal, S. K. : "Arsenic contamination in Ground Water of the Bengal Delta Basin : Implications in Agricultural Systems."