

Arsenicosis –The Biggest calamity in West Bengal

Dr.Pradip Kumar Das

**M.B.B.S.(Cal), D.T.M & H(Cal),
D.S.M.(Jad), Fellowship In HIV
Medicine (STM & CMC), M.Phil,
Master Trainers' in GFATM**

Secretary

SWASTHYA BHABNA WELFARE SOCIETY

Presents

BACKGROUND-

In 1938-the first evidence of arsenicosis in Argentina

In Bell Villi Nagar the first case of arsenicosis was detected and was recognized as Bell Villi Disease.

In 1963, different areas of North Mexico, were affected with arsenic pollution.

In Taiwan disease was named as Black foot Disease because of black

colour of the fingers resulting from gangrene

In 1987, in Thailand, a woman was detected as a patient of arsenicosis.

Here the disease was called as 'Kaidam'

In China, the first case of arsenicosis was documented in the year 1990

In 1983 Professor K.C Saha of School of Tropical Medicine, Kolkata detected the first case of arsenicosis in West Bengal. There after West Bengal was placed in the position of highest episodes of arsenicosis

throughout the world.

OBJECTIVES:

- **To detect the arsenicosis patients**
- **To provide appropriate health care services to the community and**
- **To take mitigation measures for supplying safe drinking water to the community**

METHODOLOGY

- The study conducted from village to village by a team comprising of Physicians, Dermatologists, technicians and social workers from 1st June, 2004 to 30th September,2005.
- Patients' participation was voluntary and they gave oral consent for clinical examination
- The arsenic cases diagnosed clinically in 136 villages of 17 blocks.
- It is estimated that one lakh six thousand eighty eight people in 136 villages are at risk of arsenic toxicity

METHODOLOGY

- The population at risk inhabited in 136 villages of 17 blocks with an average arsenic concentration 0.36mg/l and maximum concentration of 2.8 mg/l as revealed from the report of sample studied.
- The subjects assigned to the study group were inhabitants of arsenic affected villages. They were categorized into different age groups as below 10 years, 11-20 years, 21-30 years, 31-40 years, 41-50 years, 51-60 years and above 60 years

ARSENIC CASES BY AGE AND SEX

AGE GROUP	MALE	FEMALE	NUMBER	PERCENTAGE
7-10	7	4	11	1.13
11-20	89	65	154	15.86
21-30	125	75	200	20.6
31-40	200	70	270	27.8
41-50	100	45	145	14.93
51-60	98	20	118	12.15
ABOVE 60	65	8	73	7.53

Blockwise cases of Arsenicosis Patients

BLOCKWISE CASES OF ARSENICOSIS PATIENTS

SL NO.	NAME OF THE BLOCK	NAME OF THE DIST.	TOT. NO. OF ARNICOSIS PTS.	PERCENTAGE
1	Kaliachak I	Malda	198	20.39
2	Domkol	Murshidabad	180	18.54
3	Jalangi	Murshidabad	132	13.59
4	Bhagawangola II	Murshidabad	129	13.28
5	Berhampur	Murshidabad	4	0.41
6	Krishnanagar I & Nabadwip	Nadia	6	62
7	Krishnanagar II	Nadia	22	2.26
8	Nakashipara	Nadia	16	1.65
9	Kaliganj	Nadia	38	3.91
10	Karimpur I	Nadia	30	3.09
11	Karimpur II	Nadia	126	12.97
12	Chakda	Nadia	5	0.51
13	Gaighata	24 Pgs(N)	47	4.84
14	Deoganga	24 Pgs(N)	28	2.88
15	Baduria	24 Pgs(N)	2	0.2
16	Habra	24 Pgs(N)	2	0.2
17	Purbasthali II	Burdwan	6	0.61

Incidence of Clinical Presentation of Arsenicosis Patients

Incidence of Clinical Presentation of Arsenicosis Patients

Presentation	Total Cases Found	Total no. of Arsenicosis Patients	Percentage
Melanosis & Leuco Melanosis in Trunk, Back and Limbs	411	971	42.33
Keratosis in Palms and Soles	285	971	29.35
Hyper Keratosis in Palms, Soles & Dorsal Surface of Hands & Feet	269	971	27.70
Anaemia	253	971	26.08
Pigmentation Inside the Mucus Membrane, Tongue and lower lips	61	971	6.28
Bronchitis with Bredthlessness	45	971	4.63
Non Pitting Edema	46	971	4.73
Conjunctival Conjection	37	971	3.81
Palpable Liver	33	971	3.4
Gastritis	24	971	2.47
Hypertension	12	971	1.23
Malignancy	10	971	1.03
Myopathy	5	971	0.51
Neuropathy	4	971	0.41
Ulceration of Foot	4	971	0.41
Thyroid Swelling	4	971	0.41
Diminished Arterial Pulsation	4	971	0.41

RESULTS & DISCUSSION

- Shows that arsenicosis noted below 10 years were only 1.13%.
- Clinical manifestations of arsenicosis were noted at the age of 7 years.
- Male predominance (70.5%) was focussed with an average distribution of age between 31-40 (27.80%).
- It reflected the young and working group badly affected the country's economic structure.
- Females in this same group 31-40 (7.2%) were also the predominant sufferers affecting the home atmosphere.

RESULTS & DISCUSSION

- ❖ Out of **17 blocks under 5 districts** in West Bengal, high incidence of arsenicosis (20.39%) observed in Kaliachak block of Malda and low incidence (0.20%) in Habra and Baduria block of Nort 24 Parganas district.
- ❖ Out of 136 villages scanned for house to house survey for identification of arsenicosis patients were found in **67 villages (49.26%)**.
- ❖ Of them **8 villages of Purbasthali I & Purbasthali II Block** under Burdwan district, **19 villages of Chakdha Block** of Nadia District, **3 villages of Baharampur** block of Murshidabad district, there were no evidence of arsenicosis cases inspite of through scanning from house to house.
- ❖ Whereas in Kaliachak block of Malda district, arsenicosis patients were found in **12 villages out of 16 villages scanned** and in Domkol block of Murshidabad district arsenicosis patients were found in **12 villages out of 12 villages scanned**.
- ❖ Village incidence rate in **Malda district was (75%)** and in **Murshidabad district it was (100%)**.
- ❖ Although in Karimpur II block of Nadia district and Bhagwangola II block of Murshidabad district where the number of identified arsenicosis patient was small (126 & 129 respectively) in compare with Kaliachak block but each village showed presence of arsenicosis patients.

RESULTS & DISCUSSION

Of the 971 patients with arsenicosis, the presenting signs and symptoms were:

- Melanosis (42.33%),
- Keratosis (29.35%),
- Hyperkaratosis(27.7%),
- Pigmentation inside mucous membrane, tongue and lower lips (6.28%),
- Bronchitis with cough (4.63%),
- Non pitting edema (4.73%),
- Conjunctival congestion (3.81%),
- Hepatomagaly (3.40%),
- Gastritis (2.47%),
- Hypertension (1.23%),
- Malignancy (1.03%),
- Myopathy (0.51%),
- Neuropathy (0.41%),
- Ulceration of foot (0.41%),
- Thyroid swelling (0.41%),
- Diminished arterial pulsation (0.41%).

Conclusion :

- The present study only indicates that there is arsenic problem in the distant village of West Bengal.
- There are however other districts in West Bengal having the same geological and clinical conditions as in found in nine districts.
- Problem of arsenic in ground water is prevalent in vast areas of West Bengal putting millions of people living in those areas at risk of arsenicosis.
- This is a great public health problem which has been accepted as a calamity.
- The basic objective of arsenic problem is to supply safe water to the community.
- Arrangement need to be made for extensive water quality monitoring for all public and private tubewells regularly.
- Since many people are suffering with arsenicosis and many are at risk due to consumption of arsenic contaminated under-ground water, it is necessary to provide appropriate health care services and all mitigation measures must be supported with awareness, sensitization and motivation actions.
- The problem is reversible and must take adequate measures for its preventions with no wasting of time.

Reference:

- 1. Chatterjee A, Das D, Mondal B K, Arsenic in ground water in six districts of West Bengal, India : *The Biggest Arsenic calamity in the world, Part I, Arsenic in drinking water and urine of the affected people*, Analyst, 1995; 120: 643-650
- 2. Chowdhury U K, Biswas B K, Chowdhury T R et al, *Ground water arsenable contamination in Bengal and West Bengal, India*, Environ. Health Perspect May 2000 : 108(5), 393-97.
- 3. Garai R, Chakraborty A K, Dey S B, Saha K C, *Chronic arsenic poisoning from tubewell water*, J. Indian Med. Association 1984 Jan; 82 (1) : 43-35
- 4. Hotta, *a Clinical Aspects of Chronic Arsenic poisoning due & environmental and occupational pollution around a small Refining spot*, Jap J Cans Med., 1989, 53 (1,2): 49-70
- 5. Islam A Z M, Momin A, Sikoler M S , *Clinical manifestation of chronic arsenic toxicity in Bangladesh of 250 case study, International Conference on arsenic pollution of ground water in Bangladesh; causes, effects and remedies*. Dhaka Community Hospital Trust, Dhaka, Bangladesh, 1998 Feb : 108p
- 6. Khan A W, Ahmed S A, *Arsenic in drinking water, Health Effects and Management*. A trading Manual Department of Occupations and Environmental Health, NIPSOM, Dhaka, 1997; 47 pp.
- 7. Saha K C, *Chronic Arsenical Dermatoses from Tubewell water in West Bengal during 1983-87*, Ind Dermatol, 1995; 40:1-12
- 8. Saha K C, *A bird's eye view on arsenical calamity in West Bengal*, Indian J. Dermatol 1999, 44(3) : 1-12
- 9. Saha K C, *Melanokeratosis from arsenic contaminated tube well water*; Indian J. Dermatol 1984, 29(4) : 37-46

Reference:

- 10..Saha K C, Saha J C, Dikhit A K et al, *A review of arsenic poisoning and its effects on human health*, Critical review in Environmental Science & Technology 1999; **29(3)**: 281-313
- 11..Saha K C, *Diagnosis of arsenicosis (abstract)*, International Conference on arsenic pollution of ground water in Bangladesh, cause, effects and remedies, Dhaka Community Hospital Trust and Soles, **94-96, Feb 8-12, 1998**.
- 12..SBES: *International Conference on Arsenic and Ground water: cause, Effect and Remedy*, School of Environmental Studies(SOES), Jadavpur University, Calcutta, **1995**.
- 13.Mandal B K, Chowdhury T R, Samanta G, *Arsenic in Ground water in seven districts of West Bengal, India- The biggest Arsenic Calamity in the world*, Current Science 1996; **70(11)**: 976-986.
- 14.Mazumder D N G, *Treatment of Chronic Arsenic Toxicity as observed in West Bengal*, J Ind Med Asso.1996; **94(2)**:41-42
- 15.Mazumder D N G, Gupta J D, Chakraborty A K, et al, *Environmental pollution and chronic arsenic consensus in South Calcutta*, Bulletin of the World Health Organisation, 1992; **70**: 481-85.
- 16.WHO, *Arsenic, Environmental Health Criteria 18*, WHO Geneva, **1981**; 174 pp
- 17.World Health Organisation: *Guidelines for drinking water quality, Health Criteria and other supporting information* WHO, Geneva, 1996; 2nd ed, **2**: 43-102

Thank You!