MENSTRUAL DISORDERS IN CHRONIC ARSENICOSIS

S.K. Shah • S.K. Bhattacharya

SUMMARY

The present study reports the mentrual patterns of women exposed to chronically high level of arsenic in the drinking water. A total of one hundred women of various reproductive age group were studied in a rural subscentre of Nadia District, West Bengal over three years period. All the hundred women had either some stigmata of Arsenic Toxicity in skin like arsenic Keratoses or a high level of detected arsenic in the urine samples. Menstrual history of these affected women were compared, with one hundred women of neighbouring localities who did not consume the same source of arsenic containing drinking water and obviously without signs of chronic arsenicosis. These served as controls.

Secondly Amenorrohoea (32%) and Oligomenorrhoea (41%) were found amongst those chronically exposed to contaminated drinking water with arsenic values above 0.07 mg/L PPM to as high as 1.6 mgm/L PPM in the water source.

24 hours urine samples of the affected women source showed arsenic values ranging from 20 microgram/L to 40 microgram/L or more depending upon the duration of exposure to contaminated drinking water from one month to three years period.

INTRODUCTION

Organic arsenic is widely distributed in the environments i.e. in food, in drinking water and in soil. Prior to 1950, a major source of arsenic exposure was Fowler's Solution used for psoriasis and arsenic trioxide for Asthma.

Occupational exposure is confined to users of pesticide, glass manufacturers and to persons employed in making wood

Dept. of Obs. & Gyn., Medical College, Calcutta
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preservatives, pigments and dyes. In electronic industries, nowadays, tons of arsine gas is used as a dopant each year.

Environmental exposure to arsenic occurs following ingestion of contaminated water from tube-wells and other drinking sources.

For centuries dermatologists are conversant with skin manifestation of arsenic toxicity like pigmentary changes, Keratoses in palms and soles and Mee's lines - transverse whitish narrow bands at finger-nails in early cases. Late cases showed Gastro-intestinal disorders, malabsorbtion syndromes and hepatic cirrhosis.

It is now believed that arsenicism is a systemic disease affecting haemopioctic system, bone-marrow, Liver, Peripheral and Central Nervous system with sensorimotor polyneuropathy.

The present study analyses the menstrual behaviour of women of child bearing age chronically exposed to Arsenic contaminanted drinking water which is becoming a growing environmental public health problem in many parts of rural India.

MATERIALS AND METHODS

A cluster of patients with symptoms of secondary amenorrhoea and scanty period started pouring in from a pocket of rural West Bengal (Gelugachi subcentre of Chakdaha Block PHC of Nadia District) in 1992-1994. All these patients had some forms of skin lesion in their body, the nature and implication of which was not immediately understood. The routine investigations including thyroid functions, prolactin Assay, Endometrial biopsy, etc. failed to explore any recognised underlying etiological factors.

Incidentally a pilot study was being done by Gastro enterology Department of S.S.K.M. Hospital, Calcutta for an unusual spurt of gastro-enteritis in the locality. Door-to-door survey was done and suspicion arose regarding high arsenic content of the water source. The samples were sent to Jadavpur University Laboratory and arsenic toxicity was confirmed.

In this back-drop, one hundred affected women of the locality were thoroughly evaluated. The skin lesions were found to be indeed Arsenic induced keratoses. Twenty-four hours urine samples were sent to Laboratory and showed arsenic values ranging from 20 microgram/L to 40 microgram/L. But none of controlled group patients showed any evidence of Arsenic in the urine.

OBSERVATIONS & RESULTS

Out of 100 patients of chronic Arsenicosis, 32 cases presented with Secondary Amenorrhoea, 41 cases with Oligomenorrhoea, 10 cases of Menorrhagia and 17 cases with normal pattern.

The following tables are self-explanatory.

DISCUSSION

High arsenic level in drinking water is a public health problem in some isolated pockets in West Bengal.

Small doses and prolonged low level exposure leads to pigmentary changes within 30-40 days. It gradually proceeds with systemic effect like polyneuropathy and endocrinal disturbances.

Maximum allowable concentration of arsenic is drinking water is 0.05 mgm/L PPM. according to W.H.O. In relatively recent exposure, analysis of nails and hairs

Table I

Level of Arsenic	No. of Cases	Amenorrhoea	Oligomenorrhoea	Menorrhagia	Normal
High	30	19	6	3	2
Mid.	55	11	32	5	7
Low	15	2	3	2	8
	100	32	41	10	17

High = 40 microgram/L or more
Mid. = 21-39 microgram/L or more
Low = 20 microgram/L ore less

Table II

Menstrual Pattern of the controlled women.

Normal Mens	-	78%
Amenorrhoea	-	2%
Oligomenorrhoea	-	19%
Menorrhagia	-	1%

Table III

Duration of exposure in relation to concentration of Arsenic in the urine

Year of Exposure	Nos. of Pts.	Low	Mid	High
Less than 1 year	10	9	1	0
1 to 2 years	60	5	35	20
More than 2 years	30	1	10	19

is preferable than body fluids. A blood arsenic level above 1 mgm per litre is toxic; 9 to 15 mgm is fatal.

The menstrual disorders may be due to direct toxic effects and the rapidly dividing cells in the body bear the maximum brunt of toxicity. Neuro-endocrine System is also affected in chronic arsenicosis. Chromosomal aberration has been detected resulting in disturbance of fertility and menstrual pattern.

This is a pilot study to evaulate the menstrual problem in reproductive age group with established cases of chronic arsenicosis. Further study regarding pregnancy wastage, still birth and infertility is in progress.

The affection seems to be dose dependent and prevention of further ingestion of contaminated water and chelation with BAL may be an effective treatment in halting the process and improve menstrual function.

Chronic arsenicosis should therefore be in the ambit of etiological factors in prone areas in so far unknown causes of secondary Amenorrhoea and a search should be made to ascribe the cause to contaminated drinking water source.

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