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Study on Knowledge about Arsenic Contamination in Drinking Water among the People Living in Selected Villages of Bangladesh

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Abstract

Background: Excessive amounts of arsenic (As) in the groundwater in Bangladesh and neighbouring countries are also a major public health problem. **Objective:** The purpose of the present study was to find out the knowledge of arsenic contamination in drinking water and health hazards due to chronic arsenic toxicity among the people living in selected villages of Bangladesh. **Methodology:** This cross sectional descriptive type of study was conducted purposively among the people of the selected two villages of Bhanga Upazilla of Faridpur district from January 2007 to June 2007. All the relevant socio-demographic characteristics and data were collected by face to face interview. **Results:** A total number of 360 people were recruited. It was found that 273(85.3%) of the respondents family member used tube well water for drinking purpose. Of the respondents, 317(99.1%) persons heard of arsenic contamination in drinking water. About 284 (88.8%) respondents had the correct knowledge about identifying color of arsenic contaminated and arsenic free tube well. It was found that 176(55.5%) people knew the correct answer about the duration of use of arsenic contaminated water to causes chronic arsenic toxicity. It also revealed that 107(33.4%) respondents did not know about sign of chronic arsenic toxicity. **Conclusion:** Excellent knowledge on arsenic contamination in drinking water and health hazards due to chronic arsenic toxicity is found among the people living in selected villages of Bangladesh. (J Shaheed Suhrawardy Med Coll, 2014;6(2):57-59)

Keywords: Knowledge; arsenic contamination; drinking water

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Introduction

The demand for safe drinking-water, may be overwhelmed by other competing needs for survival. Naturally-occurring arsenic in groundwater of South and South-East Asia has also been jeopardizing the health of millions of people who have been drinking contaminated water for years[1]. Widespread and severe natural geological contamination of drinking water with arsenic is a significant health problem in rural areas of Bangladesh[2]. Due to Bengal delta plans, natural contamination of ground water with arsenic has become a crucial water quality problem particularly in Bangladesh[4]. Bangladesh Government has identified arsenic contamination of ground water and health hazards due to arsenic toxicity as an important public health problems[5]. The first effects of long-term exposure are seen in the skin as pigmentation changes and thickening (hyperkeratosis), while exposure for more than 10 years is associated with an increased risk of cancers of the skin, lungs, bladder and kidneys[2]. There are some wrong idea and beliefs about this arsenic contamination of water and its health hazards among the people. It is very important to aware people about arsenic contamination, health hazards, prevention and control. Therefore, the purpose of the present study was to find out the knowledge of arsenic contamination in drinking water and health hazards

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due to chronic arsenic toxicity among the people living in selected villages of Bangladesh

Methodology

This was a descriptive type of cross sectional study. The study was conducted in two villages of Bhanga upazilla of Faridpur district. One village was Maligram Chandra union and another was Purba Sadardi union. All adult male and female of two villages of Bhanga upazilla of Faridpur district, who were more than 18 years old were included as study population. The study was conducted from January 2007 to June 2007 for a period of 6(six) months. Purposive sampling technique was used to select adult male and female who were available and willingness to participate in the research work. Administered questionnaire was used to collect data from the respondents; data was collected from adult respondents by face to face interview. Before interview each respondent was well informed about the purpose of the study and their role in study. All data were recorded systematically. Quantitative data were expressed as mean and standard deviation and qualitative data were expressed as frequency distribution and percentage. Statistical analysis was performed by using Statistical Package for Social Science (SPSS-13). For tabulation and graphical representation, Microsoft word and Microsoft Excel were used.

Results

Out of total 320 respondents illiterate were 75(23.4%), 92(28.7%) had primary level of education. Results showed majority of respondents 273 (85.3%) used tube well water as a drinking water.

Table 1: Distribution of respondents by level of education

Education	Frequency	Percentage
Illiterate	75	23.4
Non-formal	13	4.1
Class 1-V	92	28.7
Class VI-X	70	21.8
SSC	36	11.3
HSC	28	8.8
Graduate	6	1.9
Total	**320**	**100.0**

Result showed that all most all the respondents (99.1%) heard about arsenic contamination (not shown in figure) and maximum respondents 284(88.8%) had correct knowledge about identifying colour of arsenic contamination. Result indicates that majority of respondents (55.5%) have idea about the duration of arsenicosis development. A total number of 140(44%) respondents knew about the black spot on the body is one of the sign of arsenicosis and 107(33.5%) had no idea about sign of arsenicosis.

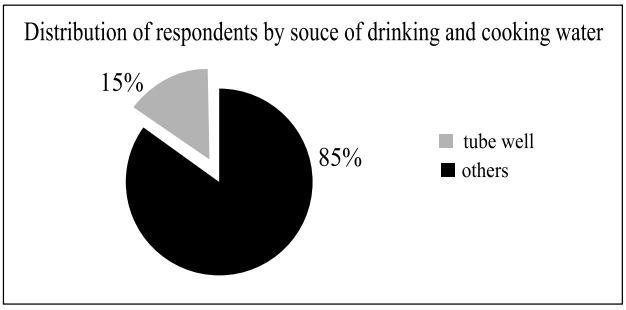

Figure 2: Source of drinking water of Taken by Family Member

Discussion

More than 90% of rural households depend on groundwater for drinking and other domestic uses. Screening of 4.7 million tube wells in arsenic-affected upazilas or sub districts which are the lowest level of administrative government in Bangladesh has shown that water in 29 per cent of these wells mainly in the south of the country contained arsenic at concentrations in excess of the Bangladesh standard for safe drinking water[2].

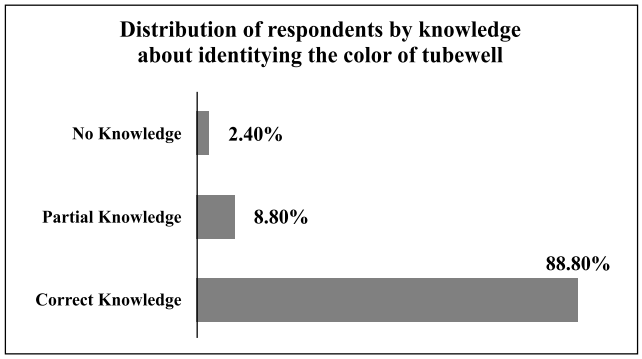

Figure 3: knowledge about identifying colour of arsenic contamination and arsenic free tube well

The maximum acceptable level of dissolved arsenic in drinking water is 0.01 mg/l and 0.05mg/l according to the World Health Organization[3]. An estimated 20 million to 25 million people in these areas are thus at risk from arsenic poisoning. In addition, more than 10,000 people suffering from chronic arsenic poisoning were identified between 1991 and 2001 in different studies[2]. The serious arsenic contamination of groundwater in Bangladesh has come out recently as the biggest natural calamity in the world. The people in 59 out of 64 districts comprising 1, 26,134 km2 of Bangladesh are suffering due to the arsenic contamination in drinking water. Seventy five million people are at risk and 24 million are potentially exposed to arsenic contamination4. In Bangladesh department of public health engineer (DPHE) first discovered arsenic contamination in ground water. It was first detected in Boroghoria union of Chapi Nawabgang district[5-7].

Table 2: knowledge about the duration of use of arsenic contaminated water to cause arsenicosis

Duration of use	Frequency	Percentage
Few days	20	6.24
Several months	54	16.88
Several years	176	55.0
Do not know	70	21.88
Total	**320**	**100.0**

The people in 59 out of 64 districts of Bangladesh are suffering due to the arsenic contamination in drinking water. In this study mean age of respondent was 37+14.8. Median

monthly family income was tk 3500.00 and range was 1000-25000tk. It was found that one fourth of respondent were illiterate. In Bangladesh adult literacy rate is 51.0% and in the rural area the rate is less than this[8]. But in present study literacy rate was high than national rate, may be due to better socioeconomic condition of the respondents. Knowledge about arsenic contamination was not influenced by literacy. Majority of respondents (85.3%) used tube well water as a drinking water. This finding was consistency with other literature[8-9]. All most all the respondent 317 (99.1%) heard about arsenic contamination.

Table 3: Distribution of respondents by knowledge about sign of arsenicosis

Sign & symptom	Frequency	Percentage
Black spot on the body	145	45.30
Swelling leg and red hand	20	6.25
Itching body	20	6.25
Blister	18	5.6
Damage kidney	10	3.1
Do not know	107	33.5
Total	**320**	**100.0**

In Bhanga upazilla 19,062 (85%) tub well has unsafe level of arsenic 2 and majority of respondents knew that tube well water was the source of arsenic contamination; only 3(0.9%) respondents had no idea about source of arsenic contamination. In another study it was reported that most of people neither had idea of arsenic contamination nor the future impact of arsenicosis[10].

Table 4: Respondents in relation to tube well use and their knowledge regarding arsenic Contamination

Tube well users	Knowledge about arsenic Contamination		Total
	Known	Don't Know	
Tube well	203	70	273
Others	10	37	47
Total	**213**	**107**	**320**

*Test statistics= 50.75 df = 1, at 0.1% level of significance, X2 value 10.83, P <0.001

It was also revealed maximum respondents 284 (88.8%) had correct knowledge about identifying colour of arsenic contamination. Majority of respondents 176 (55.5%) had idea about duration of arsenicosis development. It was revealed that about 140 (44%) respondents knew about the common symptom black spot on the body is one of the sign of arsenicosis and 107(33.5%) respondents had no idea about sign of arsenicosis. Behavior change communication plays crucial role in the improvement of health status of the people. Effective approaches and specific message can accelerate arsenic awareness at water users' level with incredible spirit[11].

Conclusion

In Bhanga upazilla arsenic level of contamination is very high. For that most of the respondents heard about arsenic contamination of drinking water. Maximum respondents had correct knowledge on use of arsenic contaminated water and majority of respondents had idea about duration of arsenicosis development.

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