

## Effect of drinking arsenic safe water for ten years in an arsenic exposed population: Study in West Bengal, India

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**ABSTRACT:** A study was done in 2010–2011 on the cohort population of 2620 of previous epidemiological study done during 1995, assessing various levels and duration of arsenic exposure in the past and its impact on arsenical skin lesion following consumption of arsenic safe water in West Bengal, India. Following drinking of arsenic safe water 36 out of 131 mild cases of pigmentation (out of 2620 participants) had cleared the lesion, while 65 cases had mild (9 new appearance) and 24 had moderate pigmentation (1 new appearance) and 7 cases had severe pigmentation during present examination. Further, 17 out of 46 mild cases of keratosis cleared the lesion, 17 remained mild (1 new appearance), 11 cases became moderate keratosis and one case severe keratosis during the present examination. Increased severity of skin lesion even following taking safe water was found to be significantly associated with higher initial arsenic level and dose of arsenic exposure.

### 1 INTRODUCTION

Reports are scanty in the literature on long term effect of chronic arsenic toxicity after stoppage of drinking arsenic contaminated water on skin manifestations. The current report is based on a study done in 2010–2011 on the cohort population of previous epidemiological study carried out in south 24 Parganas, West Bengal during 1995, assessing various levels of arsenic exposure in the past and its impact on arsenical skin lesion following consumption of arsenic safe water. The object of the study is to ascertain the natural history of arsenical skin lesion following drinking of arsenic safe water in an arsenic affected population.

### 2 METHODS

A follow up study was done on a population of 5,562 residing in 947 households during 2010–11 that was a subgroup of group of population studied during 1995 (surveyed in South 24 Parganas). The details of method of selection of the previous 1995 epidemiological study done and analysis of their drinking water sources for arsenic level has been described earlier (GuhaMazumder *et al.*, 1998).

Each participant was questioned briefly about his or her sources of drinking water, diet and water intake and clinical symptoms; a general

medical examination was done, including a careful inspection for arsenic skin lesions. Water samples were collected from private and public tube wells used for drinking and cooking purposes by each recruited household. Arsenic levels were measured by flow-injection hydride generation atomic absorption spectrophotometer. The arsenic concentration in tube well water in the villages ranged up to 3400 µg/L. Supply of arsenic safe drinking water scheme had been completed by PHED, Govt. of West Bengal through deep tube wells from spot sources and supply of filtered surface water through pipe line system covering the nine arsenic affected blocks of the district of South 24 Parganas in the state since 2001 (PHED, 2013).

Here, in this present paper; however we have analyzed 2620 subjects because of the fact that they were drinking safe water 2 for at least 10 years after the stoppage of their earlier drinking of unsafe water. Hence this constituted a cohort that was first examined in 1995 and was kept under drinking of safe water afterwards and finally reexamined in 2010–11.

Each participant was questioned briefly about his or her current sources of drinking and cooking water, and duration of water use from the source. Demographic characteristics and socio economic condition of the participant was recorded in a proforma. All patients were examined in the field by the physicians who have had long years experience in diagnosing arsenic-caused skin lesions.

