Salinity and hypertension of pregnant women in coastal regions of Bangladesh

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One of the most climatic changes effects in coastal Bangladesh is increasing drinking water salinity. About 45% salinity raised in these areas during the last seven decades (1). The intrusion of salt from the Bay of Bengal continuously contaminates the drinking water sources, such as rivers and groundwater of about one-fifth of the total area and 20 million inhabitants of the country (2). Salinity levels remain high during dry season due to low rainfall and decreased freshwater flow from the Ganges, for Farakka Barrage (3). The Padma flows at lower than one-fourth of its normal in the dry season [October–April], and water flow in the downstream network of rivers became almost stop. So, tidal water cannot be washed back to the sea (3). People of the coast suffer from the saline water to use it as every activity of daily life.

Previous literature revealed that an average daily consumption of 2 liters of water per individual, salt intake from only river water was up to 16 g/day except dietary intake (4) which exceed the recommended 2000 mg daily intake (5) which subsequently increasing the sodium level in blood and urine and blood pressure (6). It was revealed that maximum sodium in urine of pregnant women was found 387 mmol/day (1) and 240 mmol/day (6) in compare to normal40-220 mmol/day of urine (7). The Health condition may directly and indirectly be affected by increased salinity. The impacts of salinity investigation were considered a prime public health initiative in 2002 (8). Especially pregnant women become more vulnerable regarding the raising blood pressure (6). In a survey conducted in 2008, higher rates of eclampsia and gestational hypertension in pregnant women living in the southwestern coast of Bangladesh compared with non-coastal pregnant women were hypothesized to be caused by saline contamination of drinking water (2). It is established that hypertension in pregnancy is associated with increased rates of adverse maternal and fetal outcomes, both acute and long-term, including impaired liver function, low platelet count, intrauterine growth retardation, preterm birth, and maternal and perinetal deaths (9).

Very few research evidence on the topics are available in these areas. A hospital-based study described that women who drink deep and shallow tube well water had higher urine sodium than that of women dink rainwater and, the prevalence of hypertension in pregnancy was higher in the dry season than in the rainy season. However, no correlation found between Na and blood pressure after taking cutoff values for diastolic and systolic blood pressure at >85 mmHg and >130 mmHg (1). But another community-based study found positive correlation and showed that the odds of systolic bp ≥ 120 for the sodium concentration was 1.109 times greater than the systolic blood pressure of <120 and odds of diastolic bp ≥ 80 for the sodium concentration were 1.064 times greater than the diastolic blood pressure of <80 (6). Furthermore, although on non-pregnant women, a cohort study assessed the effects changing sodium levels in water of drinking-water sodium [DWS] on blood pressure [BP] portrayed that DWS concentrations were highly associated with BP. Each 100 mg/L reduction in sodium in drinking water, systolic/diastolic BP was lower on average by 0.95/0.57 mmHg, and odds of hypertension were lower by 14% (10).

From above facts, the relation between salinity and hypertension still remain unclear and need to be taken into consideration for further research. Because, salinity increased more adversely in Bangladesh then other areas of the world (4). We can hypothesize that increasing salt intake might contribute to hypertension and detrimental related birth outcome in pregnancy in the mentioned area. As the people of the study area depend mainly on the saline water for regular family use, there may be the increased chance of high sodium level in urine and rising of blood pressure which may affect the health of pregnant women.

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