

## Women bear the brunt of arsenic contamination

SYEDA NAZMA AHMED KONA

Arsenic is a toxic heavy metal found in nature. In human it can cause serious health hazard if ingested in toxic amounts. Adverse health effects include diseases of vital organs including lungs, heart, kidney, brain, and cancers of skin and urinary bladder.

Vast majority of tube-well water in Bangladesh has been found to be contaminated with more than permissible level of arsenic i.e. 50 µg/litre or more. Within the last 5 years, arsenic contamination of underground drinking water has been detected in 59 out of the 64 districts in Bangladesh exposing millions of people to the risks of arsenic poisoning.

However, because of lack of reliable information, the real magnitude of the problem is difficult to estimate. Although arsenic has been detected in underground water in recent years, many experts suspect that the contamination has been occurring for more than 20-25 years but remained undetected due to lack of studies. In the neighbouring state of West Bengal in India, arsenic has been detected during early 1980s.

The definite cause of arsenic pollution of underground water in Bangladesh has not yet been determined, although specific studies have been undertaken by the Department of Public Health Engineering and the British Geological Survey. Most authorities believe that the condition occurred due to long term geo-chemical changes in the subsoil aquifers which released elemental arsenic from its core compound called arsenopyrites. Aeration of subsoil water due to sinking of hand pumps may also be related to release of arsenic in water due to oxidation-reduction process. Some authorities believe it is due to chemical changes occurring during sediment and rock formation in the eastern slopes of sub-Himalayan regions. Nothing conclusive has yet been proven.

In human, when exposed to



arsenic, it takes long time for the clinical manifestations to appear depending on the dose and duration of ingestion of arsenic through drinking water. It may take 5-15 years for the skin changes to appear. Generally high concentrations will enhance and low concentrations will delay the appearances of signs and symptoms of arsenic poisoning. After drinking, arsenic is rapidly absorbed into the blood circulation and distributed throughout the body affecting developing child in the uterus of the pregnant women. Arsenic also comes to breast milk of the lactating mothers and can adversely affect the breast-fed children. There is no curative drug treatment for chronic arsenic poisoning, although some benefit has been shown by treatment with antioxidant vitamins in Bangladesh which needs further confirmation.

Early signs of chronic arsenic poisoning appear in the skin which is characterised by changes in skin colour, such as dark and white spots (melanosis) specially on the palm and soles of feet. Roughness of skin with follicular changes (keratosis) may appear anywhere on the body surface. Besides these, there may be generalised weakness, difficulty in breathing, diabetes, high blood pressure, and other non-specific symptoms found in most patients with chronic arsenic poisoning.

Since arsenic poisoning is relatively a new disease in Bangladesh, most people even the physicians are not familiar with the condition. Lack of public and medical awareness about the causes and consequences of the disease led to confusion. Many people believe that the skin condition is contagious or is an expression of leprosy. In fact, arsenic poisoning is not leprosy, neither it is transmitted by person to person contact. People develop arsenic poisoning only by drinking contaminated water or from other environmental sources such as contaminated air.

In a survey carried out by the Bangladesh Arsenic Control Society in Charghat Thana in Rajshahi district, it was observed that women affected with arsenic poisoning are being socially discriminated in the community, young girls are facing difficulties in attending schools, women are ostracised, and there are instances of divorce, broken family, and social injustice. Because of the skin changes, working women

are discriminated in their working environments and many have to leave their jobs leading to economic hardship and social disruption. It is difficult to arrange a marriage for girls known or suspected to be affected with arsenic.

Since more women than men are exposed to water through their domestic and household activities such as washing, cooking and cleaning, women are at special risk of coming in contact with contaminated water and developing arsenic poisoning. Unlike men, most rural women remain at home



Tube-well water must be checked that whether they are contaminated by arsenic

and they are less likely to drink water from outside sources. All these factors make our rural women more risky for developing arsenic poisoning.

For these reasons, women need to be especially aware about arsenic poisoning and how to reduce its risks to women health. It is noticeable that arsenic does not only enter human body through drinking but also through skin contact with contaminated water during washing, cooking, and cleaning activities. Pregnant women and lactating mothers need to be educated that arsenic can affect their child in the womb and also the breast-fed child.

Boiling contaminated tube-well water does not remove arsenic but adequate heating can destroy most disease producing germs in water from any source. Arsenic can not be detected by changes in colour, taste, or clarity of water, arsenic can only be detected by testing a water sample in the laboratory. So if you are in doubt, take a sample of your tube-well water to a testing laboratory.

Different areas of Bangladesh have different levels of arsenic in its ground water, but generally shallow tube-wells of

50-100 feet deep are mostly contaminated, deep tube-wells are less likely to be contaminated. Rain water is a natural source of arsenic free water, it is also clean from germs of diseases; it can be a useful source of safe drinking water if properly collected and used. Water from rivers, lakes, and ponds are less likely to be contaminated with arsenic but these are contaminated with germs, therefore water from these sources must be sufficiently heated before drinking or used for cooking. Water from the contaminated tube-well

should not be used for drinking as well as cooking. Water from the contaminated tube-well should not be used for drinking as well as cooking, it should be avoided for washing food and bathing also because arsenic can enter the human skin through external contact. Different types of domestic water filters are now available commercially, these can be used to purify arsenic contaminated water at home. Moreover, the government and the NGOs are developing large-scale community water supply projects; these include rainwater harvesting, construction of underground reservoirs, slow and filters, and chemical treatment.

Arsenic contamination is a vast problem of national priority. Because of its nature; it needs support from multiple disciplines including doctors, social workers, engineers, geologists, geo-chemists, and laboratory analysts. Commitments of government and policy makers are essential for a successful campaign against arsenic pollution in Bangladesh.



## Dengue alert: You can manage it even at your home

Dengue fever is a disease caused by infection with a type of virus called *Flavivirus*. There are four different subtypes of this virus producing varying manifestations of the disease. The disease is spread through the bites of mosquitoes belonging to the *Aedes aegypti* species. The disease is essentially a tropical one and is endemic in large parts of Latin and South America. Of late, its incidence has been on the increase in Asian countries such as India and our country.

### Cause and pathogenesis

Dengue fever is transmitted to humans by the bite of the infected *Aedes aegypti* mosquito. The *Aedes* mosquito breeds in relatively fresh water, lives close to human habitations and bites during the day. The incubation period between the bite and the onset of symptoms is usually two to seven days. The *Aedes* mosquito is also responsible for the spread of diseases such as yellow fever and Chikungunya virus fever.

### Symptoms and signs

A large number of infections may be sub-clinical, that is, the patients may not even be aware that they have had the disease. The infection usually manifests itself as fever with severe body pain or myalgia. There may be an associated rash over parts of the body. The body pain is so intense that this disease has been called *break-bone fever*. Quite often, the disease makes no further progress and the patients recover. However, some patients may develop involvement of either of the two dreaded syndromes in Dengue - bleeding (called *DHF* or *Dengue Hemorrhagic Fever*) or involvement of the brain with altered consciousness (encephalitis). Fatalities are higher among patients in whom these complications are present. Joint pain is another symptom though there may not be true arthritis. Associated symptoms include severe headache, vomiting, and photophobia. Examination of the patient may reveal few findings such as a rash and pain on palpation of the muscles. These symptoms usually last for a period of two to five days and most patients who do not have complications recover completely.

The risk of complications appears to be greater in children, particularly the risk of bleeding and DHF with its high fatality rate. Some patients may also go into shock, a condition known as *Dengue Shock Syndrome* (DSS). This too carries a higher risk of mortality.

### Investigations and diagnosis

The diagnosis of dengue is based on the clinical presentation, knowledge of the area in which the person lives, and laboratory investigations. Blood tests may show a low white blood cell count, a low platelet count, and elevation of certain enzymes.

The definitive diagnosis is, however, made by isolating the virus in the blood of the individual during the acute phase of the disease or by detecting antibodies to the virus in the blood. Antigen detection is also possible. A rise in the antibody titre is a useful method of diagnosis. Investigations also need to be done to rule out other likely causes of fever such as malaria, and leptospirosis.

### Treatment and prognosis

Treatment is usually supportive and symptomatic. Analgesics, anti-pyretics, and broad-spectrum antibiotics are used during the acute phase to minimise the risk of secondary infection. In cases of bleeding, blood transfusions are required. Shock, if present, needs to be aggressively treated with fluids, oxygen, and close monitoring. Most patients will recover without any sequel. The overall mortality rate with effective treatment is close to 1% but this may be higher in children.

### Prevention

Control and elimination of mosquito population is the best method of prevention. A vaccine is in the late stages of development but is still not available for commercial use on a large scale. Control of the mosquito population reduces the incidence of dengue, yellow fever, and certain other rare fevers that are also transmitted by the same species of mosquito.

Source: <http://www.webhealthcentre.com>

## Who gets diabetes?

There are factors that can put you at higher risk for developing the condition:

- Being overweight (body-mass index of 25+)
- Carrying fat around the waist and stomach
- Being sedentary
- Being more than 45 years old (being over 65 increases risk even further)
- Having a family history of type 2 diabetes
- Having gestational diabetes or having a baby that weighed 9 lbs or more
- Having a low high-density lipoprotein (HDL) cholesterol level (less than 35)
- Having a high triglyceride level (250 or above)
- Having high blood pressure (140/90 mm/Hg or higher)

## SARS vaccine may be on the horizon

A vaccine against severe acute respiratory syndrome (SARS) has proven successful in an animal model, scientists from the University of Pittsburgh report.

While cautioning that a human vaccine to protect against SARS is probably still years away from the market, the researchers say the tested vaccine looks promising.

"Many other groups are working on similar approaches, but this is the first [SARS] vaccine study that will be reported in a peer-reviewed journal," says Dr. Andrea Gambotto, assistant professor in the departments of surgery and medicine at the University of Pittsburgh School of Medicine and the project leader.

Gambotto's team, working with colleagues from the U.S. Centers for Disease Control and Prevention, immunised six rhesus monkeys and administered a placebo vaccine to two control animals. Second doses were given at 28 days. Six weeks later, the researchers evaluated whether they had gotten an antibody response, which shows protection against the disease. All six animals that got the vaccine had detectable antibody levels but neither control animal did.

The animals that received the vaccine also had detectable levels of T-cells, a kind of white blood cell involved in the immune system response to foreign invaders.

SARS is caused by a coronavirus, called SARS-associated coronavirus, that scientists discovered months after SARS was first reported in

Asia in February 2003. Before its containment earlier this year, the SARS epidemic of 2003 sickened about 8,098 people worldwide and killed 774 of them, according to the World Health Organization.

The new SARS vaccine was developed, Gambotto says, by first engineering a common cold coronavirus to express the SARS coronavirus antigens. (Antigens are substances such as toxins or bacteria that, when introduced into the body, stimulate the production of protective antibodies.) Then, when the vaccine is injected, it first infects cells and then stimulates an immune reaction to the SARS antigen. The bottom line is protection against the disease, the researchers say.

"These animals do not get SARS like humans, but they do have an antibody response," Gambotto says. "This antibody response was a very strong response. What we are now doing is following the animals to monitor their long-term response, to see how long the response will last."

"One of the research difficulties, as the authors point out, is [having] a valid disease model of SARS," he says.

Winram notes that many other groups of scientists are also researching a SARS vaccine and are taking other approaches. Which vaccine will eventually prove best? "We will have to wait and see," he says. "None are yet to clinical trials."

Source: <http://health.yahoo.com>

## 'Plaque' build-up may occur faster in arthritis

Thickening of blood vessel walls -- a sign of "plaque" build-up -- seems to occur faster in people with rheumatoid arthritis, Japanese researchers report. This may explain why the disease has been linked with an increased risk of death from heart disease.

The results also indicate that blood tests that measure inflammation and bone changes can predict how fast such thickening will occur.

Rheumatoid arthritis is an "autoimmune" disease in which the body attacks its own tissues. The disease shows not be confused with osteoarthritis, which is more common, less serious and results from wear and tear on the joints with age.

The new findings, which are reported in the medical journal *Arthritis and Rheumatism*, are based on a study of 62 women with rheumatoid arthritis and 63 healthy women. Ultrasound was used to assess blood vessel wall thickness when the study began and again several months later. Blood tests of inflammation and

bone changes were also measured at enrollment.

Dr. Masaaki Inaba, from Osaka City University, and colleagues found that arthritis patients experienced a greater increase in vessel wall thickness during the study period than did healthy women.

On further analysis, the C-reactive protein level -- a test for inflammation -- and the urinary calcium-to-creatinine ratio -- a test for bone changes -- were both predictors of the rise in vessel wall thickness seen in RA patients.

"This is the first prospective study demonstrating accelerated (blood vessel wall) thickening in patients with rheumatoid arthritis," the researchers state. "Further studies are needed to examine whether strict control of rheumatoid arthritis can prevent (plaque build-up) and reduce the risk of death from" heart disease and related causes, they add.

Source: <http://www.reuters.com>

## Fact sheet on osteoporosis

Osteoporosis is a condition that causes the bones to soften, resulting in skeletal weakness and fractures. It is characterised by a generalised, and progressive decrease of bone mass as bone resorption exceeds bone formation. It may be caused by various factors including dietary deficiencies, endocrine imbalances, drugs, disease, old age etc. Postmenopausal women are the most susceptible to primary osteoporosis with an estimated 32 percent of these women developing the disease. Osteoporosis is one of the most common causes that result in bone fractures, especially in the elderly.

### Cause and pathogenesis

The cause of primary osteoporosis is not known. However the factors that contribute include a deficient calcium intake, early menopause, sedentary life-style without adequate exercise, and a familial history of the disease. Secondary osteoporosis may be caused by endocrine disorders such as hypogonadism, hyperthyroidism, hyperparathyroidism, and

diabetes mellitus. Prolonged use of chemical substances like corticosteroids, nicotine, barbiturates, or heparin can also lead to osteoporosis. Underlying chronic disease (renal or hepatic disease, malabsorption syndrome, pulmonary disease, rheumatoid arthritis, or sarcoidosis etc), and weightlessness or immobility for a prolonged duration contribute to osteoporosis. The disease occurs as bone resorption exceeds bone formation, the bone tissue mass progressively decreases but the bone is morphologically normal. The cortical thickness decreases, as do the number and size of bone trabeculae with normal osteoid seams.

### Symptoms and signs

The individuals affected by the condition are usually asymptomatic early in the disease. The initial symptom is usually a dull, aching, constant pain that is felt in the bones, particularly the back and chest regions. The pain may radiate down the leg and lower limbs, and muscle spasms may be present. As the spinal

column mass decreases, dorsal kyphosis (antero-posterior curving of the spinal column) occurs and cervical lordosis also increases, leading to multiple compression fractures of the spine and a reduction in height of the patient. Other fractures occur with minimal or no trauma due to the excessive weakness of the bones. Potential complications result from immobility, from increased fractures and deformity from spinal crushing may occur.

### Investigations and diagnosis

Clinically, the characteristic complaint is bone pain. X-ray examination of the bones revealing decreased radio density is a characteristic finding. Also, Photon Absorptiometry, and quantitative Computed Tomography (CT-Scan) showing decreased bone density of the spine, aids in the diagnosis of the condition. Endocrine tests and hormonal levels can also be assayed to detect any imbalances. Serum Calcium levels are also monitored regularly to detect any

lowering in Calcium levels.

### Treatment and prognosis

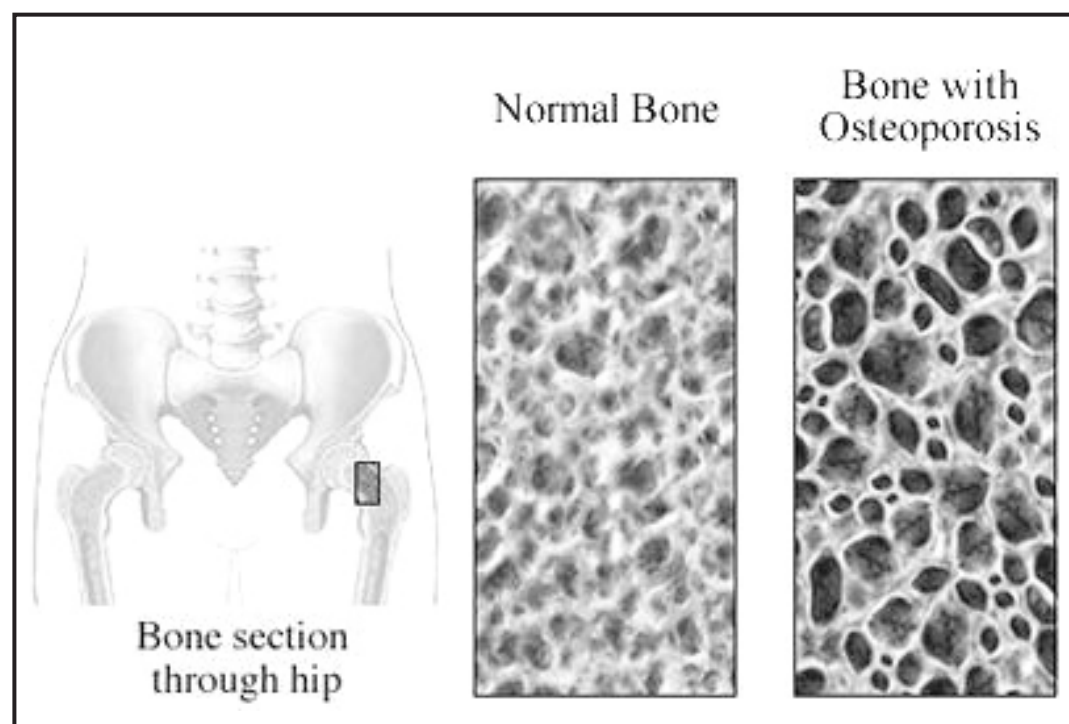
The aims of general treatment are to prevent further bone loss, to increase formation of bone, and to prevent fractures. In some patients bone loss has been decreased or stopped with an increased intake of calcium supplements and vitamin D. For women, treatment with estrogen or estrogen combined with progesterin has been effective in reducing and preventing further bone loss. Research indicates that the compound sodium fluoride, given with calcium and vitamin D, stimulates bone formation. A regular exercise regimen is necessary, including weight-bearing, hyperextension and resistance exercises to slow calcium loss and strengthen the weakened musculature. Hot compresses and massage for muscle spasm are effective in relieving pain and spasms. Orthopaedic prosthesis may need to be provided for the back and neck to prevent stress fractures and to provide support. Walking aids may be needed. A high-protein diet is necessary.

The regular monitoring of calcium levels is essential.

Estrogen-Progesterone combinations for postmenopausal women are administered. Non-Steroidal Anti-Inflammatory Drugs (NSAID) are used for relief of pain. Also, Biphosphonates and growth factors may be used to treat the condition. Surgical treatment is done for correcting any deformities or fractures of the bones. Osteoporosis patients must be given prompt treatment and must avoid undue stress that may result in fracture of the bones. Physiotherapy and counselling are also important in the treatment of the disease.

### Prevention

Treatment of the causative factors like endocrine disorders, and toxic drug use can help to prevent the condition in patients in whom the disorder arises because of these reasons. A diet rich in calcium can help reduce or prevent the bone resorption. Dietary calcium is absorbed better than calcium from supplements. Many calcium-rich foods are also high in



protein, vitamin D, phosphorus, and fibres.

The following foods provide a good source of calcium - milk, yogurt, ice cream, cheese, fish, dark green vegetables, cauliflower. Children need 400 to 700 mg of calcium per day. The requirement increases to 1,300 mg per day for adolescents and

about 1,000 mg per day for adults. After menopause, women need 1,500 mg of calcium per day. About 400 international units (IU) of vitamin D is needed daily. Vitamin D-fortified milk and multiple vitamin supplements are good sources of vitamin D. Regular clinical examination and monitoring of

Serum Calcium levels is also essential for early detection of the disease.

Source: <http://www.webhealthcentre.com>