Truth about Arsenic and Kidney disease

While the researches are continuing to elucidate the cause for chronic kidney disease of unknown aetiology (CKDu) in North Central region of Sri Lanka, a huge propaganda is seen forcibly convincing the public to accept the cause of CKDu as Arsenic. In the backdrop of silence maintained by the health authorities, I would like to enlighten the readers on the factual situation.

Scientific and undeniable identification of the cause for the CKDu epidemic is essential to offer specific treatments for the affected patients as well as to take targeted preventive actions which may cost millions of rupees. Though it should be done at the earliest, we should not hurry to go for sensational and non-scientific conclusions.

Proposed causative factors
Lead, Aluminium, Agrochemicals’ direct toxicity to kidney, some Ayurvedic preparations, Cadmium, Arsenic, Algae, illicit alcohol, hardness of water, Fluoride, Uranium, Mercury, snake venom, Mycotoxins, Ochratoxins and genetic factors are among the hypothesized causative factors. Some researchers have studied some of those factors but no conclusion has been made as to the real cause for CKDu.

Intervention of WHO
On January 2008 the MoH requested World Health Organization (WHO) to help in identifying the underlying cause. A comprehensive research proposal was made and according to the timetable put forward at that time the final report was to be released by the end of 2009. Later it was postponed to September 2010 and then again to June 2011. However, on 25th June 2012 WHO representatives held a media briefing in which it was revealed that the heavy metals like Arsenic and Cadmium may play a role in the causation of CKDu. Further it was said that Arsenic or Cadmium levels are not raised in water sources and further research is in progress. No documents were released to the media in that meeting.

So far neither the MoH nor the WHO research team has published a final report on CKDu.

Forcing to accept Arsenic as the cause
A certain group is trying their maximum to convince the public to accept Arsenic as the cause for CKDu and they go further to attribute that to agrochemicals and fertilizers. While throwing ugly criticism for those who do not agree with them they recently published some documents said to be from WHO research team. Intellectuals including medical specialists, experts in water, agriculture, geology etc who rely on scientific proof in such a serious issue rather than on divine powers or political ideology have not yet agreed on this unsubstantiated theory. These few paged documents are neither signed nor in a letter head. If considered as genuine, according to the headings these documents are just ‘Mission reports’ prepared by Dr. Shanthi Mendis who mediates research on behalf of WHO, to report the progress of the research. They are not final research reports.

Reality
Usually it is a published final research report that should be analyzed scientifically. But, due to the misleading propaganda which is done quoting those reports and considering its adverse consequences, sidelining intellectuals who are really concerned in sorting out the truth and misleading of the public, it is necessary to reveal the reality about Arsenic and CKDu.

Even in these reports it is not mentioned anywhere that the cause of the CKDu is confirmed as Arsenic. Following points should be strongly considered when interpreting finding of the researches so far.

1. It is mentioned in the report that about 90% of the studied people had raised Arsenic level in hair and nails. Arsenic is present in varying amounts in our surrounding environment like soil, rocks, certain water sources, sea food like fish, meat and various other food we eat, rainwater, air, sea water and industrial effluents. Some
amount enters our body through food, water, inhalation and skin absorption. Arsenic gets detoxified or metabolized in the body and excreted through bile and urine. A certain amount heavily concentrates in tissues like skin, nails and hair which contain keratin. In short, we all have Arsenic in our body (average 10-20 mg). Arsenic concentration can go up when kidney, the main excretory organ fails. Toxicity occurs if the exposure exceeds the normal detoxifying and excreting capacity.

Arsenic in hair and nails occur in very minute quantities. The levels can show higher values if contaminated with Arsenic in the environment. So, very meticulous standards have been put forward on the collection and analysis of samples and we have no idea if researches follow those criteria strictly.

Arsenic prevails in many forms in the environment and only certain varieties cause toxicity to human.

2. In the report it is clearly mentioned that excess amounts of Arsenic was not found in samples taken from various drinking water sources. Apart from the above group none of the other researches who tested water, soil, food samples including the WHO team have found excess of Arsenic. But in countries where mass scale Arsenic poisoning occurred the contamination of water sources has been clearly established.

3. It is said in the report that urine samples of 63% of patients contained Arsenic. Researchers as in Taiwan have found excess urine Arsenic in CKD patients who have never been exposed to excessive amounts of Arsenic. It is not clear if Arsenic is the cause or if the CKD patients excrete excess amounts of Arsenic than healthy persons due to defects in normal detoxification mechanism.

Arsenic in urine can rise remarkably even in a healthy person who consumes sea food like fish. Therefore it is essential that the patient refrain from ingesting such food for at least three days prior to the sample collection. We are not sure if this caution was adhered to.

4. Chronic Arsenic poisoning is reported from many countries. The worst ever mass scale poisoning occurs in Bangladesh where 80 million people in 61 districts are at risk. Thousands of patients are showing features of Arsenicosis, clinical syndrome which occur due to chronic intoxication with Arsenic. 5 million people in West Bengal in India are at risk of Arsenic poisoning. In both of these countries deep wells extending in to the earth, heavily laden with Arsenic, have been found as sources of Arsenic. In Thailand, rain water collecting in tin mines and then contaminating drinking water sources have been found as culprits. Argentina, Chile, Mexico, Taiwan, Nepal, China and USA are among the other countries where chronic arsenic poisoning is reported.

Health effects of chronic Arsenic poisoning have been well recognized in relation to such established poisoning episodes. 98% of patients show specific skin manifestations, about half gets various cancers including skin, lungs get affected in 64% and 44% develop various neurological defects. Apart from that involvement of blood vessels causing gangrene etc, diabetes, hypertension, swelling of liver/spleen and reproductive systems pathologies are well recognized. With regards to the effects on kidney, kidney cancers are the ones reported. (for further details please see reports and publications including those of WHO and its regional office SEARO/WHO in relation to Arsenic poisoning)

Except for such well recognized clinical manifestations no region in the world which got clear Arsenic poisoning reports an epidemic of CKD.

Recently, some authors doubt if chronic arsenic exposure affects kidney function; but has not come to any consensus. The medical text books and other publications on chronic arsenic poisoning do not talk about effects on kidney or else just mention about cancers in it. To highlight a research; on analysis of 158 patients in West Bengal who were exposed to Arsenic, all showed some skin manifestation and other features of Arsenicosis at varying percentages but non showed any degree of kidney dysfunction.

CKDu patients in North Central region have not shown any of those well established features of chronic arsenic poisoning. If the reality is this, how does only a massive epidemic of kidney failure occur without a clear arsenic exposure and with no other associated disease manifestations of Arsenicosis?
5. Giving Arsenic free water will not suffice for Arsenic affected patients. Skin applications should be prescribed to prevent skin cancers. There is a group of drugs called chelating agents which have shown some efficacy in eliminating excess Arsenic from body. So far no one has recommended them for our CKDu patients because there is no confirmation of Arsenic toxicity.

6. Once such a nationally important research ends and if the researches are satisfactory about methodology, findings and conclusions the research paper should be published in a peer-reviewed publication so that experts within and outside the country can peruse and express opinion. But so far that has not been done.

7. The above group states that the Arsenic poisoning occurs due to agrochemicals and fertilizer. But in a study done by the office of Registrar of Pesticide, out of 28 tested agrochemicals Arsenic was found only on 3 and that too were in low quantities. And also, such CKD epidemics have not been reported from other areas in the island using agrochemicals or from other parts of the world. CKD epidemics are not seen in areas showing higher concentration of Arsenic in water sources than those in Anuradhapura. (Above facts are based on local and international research and publications including those of WHO)

Unarguably we accept that the agrochemicals are used dangerously and indiscriminately in the country. All the effort should be taken to minimize the consumption by introducing alternatives.

Though there is no substantial evidence to accept Arsenic as a cause for CKDu epidemic, considering Arsenic toxicity in neighbouring countries, increase in the number of deep wells and mines and accumulation of industrial pollutants in the environment in Sri Lanka, an island wide survey and mapping of will be of great importance.

**Responsibility**

We cannot accept the silence maintained by the MoH and the WHO amidst this misleading campaign using one their document by a third party. We hope that both of these institutions will rectify the situation soon and expedite scientific identification of the real cause. And also, it is the responsibility of the authorities to maintain an environment in which researches and intellectuals who are genuinely interested and capable can work without hindrance.

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