

Bio-terrorism the cause of Chronic Kidney Disease?

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A chronic kidney disease (CKD), among farming communities in the North Central province of Sri Lanka, has been observed recently.

Local medical researchers have come up with several possible causes for the disease, including high groundwater fluoride content in some affected areas, leaching of heavy metals such as cadmium from agricultural chemicals into water sources, exposure to inorganic pesticides and fertilizers and usage of aluminum vessels to store drinking water.

Unfortunately, none of the studies conducted were unable to conclusively prove the etiology of the disease.

Dr. Channa Jayasumana of Rajarata University has put forward a rather different hypothesis for CKD. Dr. Jayasumana and his team have observed a higher number of chronic kidney disease patients from villages located adjacent to so called Eelam territory in Sri Lanka.

Furthermore, he claims that bioterrorism could be the causative factor for CKD in the North central and Eastern regions. Could CKD be a result of bioterrorism? Is it even possible?

Bioterrorism is the intentional use of micro-organisms to bring about ill effects or death to humans, livestock, or crops. Biological Warfare (BW) agents can cause large numbers of casualties, with minimal logistical requirements. Perpetrators can escape long before BW agents cause casualties, due to the incubation periods of the agents. Weapons are easy and cheap to produce and can be used to selectively target humans, animals, or plants.

Pathogens maybe used against personnel, animals, or plants. Agents may kill or incapacitate victims. Incapacitating agents maybe more effective in battle, by both preventing a unit from carrying out its mission and overwhelming medical and evacuation assets. Agents with short incubation times would be most effective in a tactical setting, while those with longer incubation periods would appeal more to terrorists.

Biological attacks could be attempted by contaminating food and water supplies. While intact skin is an excellent barrier to most biological warfare agents, some agents, such as tricothecene mycotoxins, can penetrate the integument and cause systemic illness. Tricothecene mycotoxins ('Yellow Rain').

In 2005/4/21, the 'Divaina' newspaper reported a yellow rain incident in Thalawakele. They are the only potential BW toxins with cutaneous activity and manifestations. Mycotoxins are a diverse group of small molecular weight compounds produced by fungi. Spores of mycotoxin-producing fungi are possible anti-personnel biological weapons agents due to their stability, ease of manufacture and ease of dissemination in aerosol form. For example, *Fusarium*, *Stachybotrys*, *Memnoniella* fungi strains produce more than 100 compounds classified as tricothecenes. T-2 toxin, a biological warfare agent, is probably the best known of the tricothecenes, and is believed to be the mycotoxin responsible for some forms of aleukia (the absence of white blood cells). T-2 toxin is believed to have killed thousands of Soviets who ate mold-infested cereal grains toward the end of World War II.

The fungi *Penicillium* produces several toxins, including ochratoxin A, which has been shown to cause miscarriage, birth defects and kidney damage in experimental animals. It has also been linked to a form of kidney disease found in people in the Balkan Valley region of Bulgaria and former Yugoslavia (another conflict region). The family of ochratoxins consists of three members, A, B, and C, which differ slightly from each other in chemical structures. These differences, however, have marked effects on their respective toxic potentials. Ochratoxin A is the most abundant and hence the most commonly detected member, but is also the most toxic of the three and is a potent toxin affecting mainly the kidney.

Also, the use of depleted uranium (DU) in ammunition is known to cause dramatic side effects, such as kidney diseases, stillborn babies, toxic and poisonous land, water supplies, and residential territories. NATO's use of DU ammo in former Yugoslavia has resulted in extensive irreversible damage to kidney and partial kidney failure in many civilians.

According to certain intelligence agencies, Israel is trying to identify genes carried only by Arabs that could be used to develop a biological weapon (ethnic weapons) that would harm Arabs, but not Jews. Furthermore, the report says that Israeli scientists are working to

create a genetically modified bacterium or virus that only attacks people who carry certain genes.

Considering the developments and historical events related to biological/chemical and genetic warfare agents, it is certainly a possibility that terrorists and their allies could use such weapons to systematically destroy the people residing in a certain area. It is the responsibility of the GOSL to investigate the past activities of INGOs and NGOs in the CKD affected areas and also conduct unbiased research into finding the etiology (and creating a national CKD database), of the disease.