(2) WHO CKD*u* STUDY NOTES- PROGRESS REPORT

World Health Organization (WHO) report on Chronic Kidney Disease of unknown etiology (CKDu) in Sri Lanka-

01. Mission report , 6-8th June 2011, Dr.Shanthi Mendis , Senior advisor and coordinator, Chronic disease prevention and management, WHO, Geneva, Switzerland

- Results of the phase 01 of this research programme reveal that in the north central and Uva provinces a minimum of 15% of people in the age group 15-70 years are affected by CKDu.
- Man over the age of 40 years who are engaged in farming for more than 10 years are at higher risk of developing this disease. In addition exposure to agrochemicals also increases the risk of developing CKDu.
- The majority of men and women suffering from this disease excrete raised levels of arsenic and/or cadmium in the urine.
- Exposure to a combination of factors that are toxic to the kidney seems to cause this kidney disease. Toxic factors identified up to now include arsenic, cadmium and nephrotoxic agrochemicals.
- Recommend to develop a regulatory frame work to improve the quality control of imported fertilizer particularly with regard to nephrotoxic agents such as arsenic and cadmium.
- It is imperative that the steps are taken as soon as possible. Delaying action will cause further accumulation of toxic agents in the environment and result in cumulative damage to the health of the people living in these areas.

02. Mission report, 5-7 October 2011

- Cumulative nature of heavy metal exposure and progressive natural history of CKDu for which there is no known cure, demand urgent action to improve safe use and quality control of agrochemicals and quality control of fertilizer.
- As advised by the Honorable minister of Health, a multisectoral strategic plan need to be developed jointly with relevant ministries with short, medium and long term measures by the end of 2011 and implemented as early as possible in 2012 to minimize the growing public health risks to the population.
- It is essential that steps are taken as soon as possible. Delaying action will cause further accumulation of toxic agents in the environment and result in cumulative damage to the health of the people living in these areas and with time also affects younger age groups. In the long term there will also be severe social and economic consequences that will negatively impact the on going development and poverty alleviation efforts of the region.

03. Progress report 13 Feb 2012

- In the urine analysis of 496 cases of CKDu 56% had a urine cadmium excretion over 1 ug/g creratinine. Data from recent studies show that changes of early kidney damage occurs at cadmium excretion levels of even 0.6-1 ug/g creratinine. About 63% of CKDu patients had urine arsenic levels above 21 ug/g Ceratinine. Urine arsenic levels above 21 ug/g creatinine have been shown to cause changes in kidney tissue that lead to chronic kidney disease.
- Approximately 88% of CKDu patients had urine arsenic >21 ug/g and/or urine cadmium >0.6 ug/g
- Arsenic was also analyzed in hair and nails of people living in NCP including CKDu patients. In about 90% arsenic levels in hair were higher than those observed in developed countries (0.02 ug/g).In about 94% arsenic levels in nails were higher than those observed in developed countries (>0.03 ug/g)
- Our analysis did not find high levels of cadmium exposure as reported in previous studies. The mean exposure for adults is at borderline of Recommended Total Weekly intake (TWI) of 2.5ug/kg body weight.
- Water from 98 water sources used by patients with CKDu was analyzed for hardness. 99% are hard to very hard. Hardness of water is known to affect heavy metal toxicity through antagonistic mechanisms and this may play a role in renal toxicity caused by heavy metals in the north central province.

Recommendations

01. Implement the recommendations in previous reports.
02. Strengthening the institutional arrangements for the implementation inter sectoral coordination, monitoring and evaluation of control of pesticides and fertilizer.
03. Increasing the public awareness of the adverse health effects of agrochemicals. The general public should be made aware of the actions taken to control agrochemicals and the importance of applying safety and control measures. Health education programmes should focus on high risk populations including farmers, vendors and also expanded to involve school children and the public at large.
04. Strengthen water purification schemes in north central region. Recommendations have been made for the maximum and minimum levels of calcium and magnesium in drinking water and total hardness.
05. As there are 66 ayurvedic prescriptions that contain aristolochia, increase awareness of ayurvedic practitioners and public of renal toxicity of aristolochia species.