



Viral outbreaks and communicable health hazards due to devastating floods in Pakistan

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Abstract

Pakistan is a developing country that has a population of 190 million people and faces a huge burden of viral diseases. Every year during monsoon season heavy rain

fall and lack of disaster management skills potentially increase the transmission of waterborne diseases, vector borne diseases and viral outbreaks. Due to severe flooding, thousands of people lose their lives and millions are displaced each year. In most of the cases the children who lose their family members are forced into illegal professions of begging, child labor and prostitution which make them prone to sexually transmitted infections. Up to date, no scientific study has been conducted nationwide to illustrate epidemiological patterns of waterborne diseases, vector borne diseases and viral epidemics during flash flood. Mosquito sprays would not be a sufficient approach for dengue eradication; mass awareness, larvicide and biological control by Guppy fishes are also effective strategies to overcome dengue problem. International health bodies and non-governmental organizations must take note of this alerting situation and take adequate steps such as financial/medical aid in order to defeat the after-effects of flood.

Key words: Health hazards; Viral outbreak; Dengue; Flood; Waterborne diseases

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Core tip: In Pakistan every year monsoon brings havoc in term of devastating flood. Lack of management skills results in increased transmission of waterborne diseases, vector borne diseases and viral outbreaks. Due to severe flooding, thousands of people lose their lives and millions are displaced each year. In most of the cases the children who lose their family members are forced into illegal professions of begging, child labor and prostitution which make them prone to sexually transmitted infections.

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TO THE EDITOR

In Pakistan, heavy rain fall and lack of disaster management skills potentially increase transmission of waterborne, vector borne diseases and viral epidemics. Communicable diseases with increased risk of transmission during flood includes viral hepatitis A, cholera, typhoid fever, leptospirosis, malaria, West Nile fever, yellow fever, dengue and dengue haemorrhagic fever. The country suffers loss of numerous lives each year due to unprepared set of mind. It has been reported that over the last three years, due to severe flooding, thousands of people have lost their lives and millions have been displaced. Many people lost their conscious state of mind and mental health was seriously disturbed. Sometimes children who lost their family members are forced into illegal professions of child labor, begging and prostitution which make them prone to sexually transmitted infections. If the similar situations remain persistent during the upcoming years, serious viral epidemics, acting as threatening viral time bomb could wipe out the entire nation. Policy-makers must provide wider opportunities for the dissemination of awareness and knowledge related to silent routes of viral transmission and focus on epidemiological patterns associated with emerging viral infections in Pakistan^[1,2].

National Disaster Management has reported 118 deaths, above 800 injuries and loss of 325000 acres of crops land, due to a flash flood which affected nearly 1700 villages^[3]. The healthcare facilities are mainly administered by private sectors in Pakistan. Healthcare and sanitation systems are inadequate at urban sectors and very poor in rural areas^[4]. The government of Pakistan has provided limited healthcare facilities as compared to rapidly increasing population. It has been reported that there are 127859 doctors and 12804 healthcare infrastructures in Pakistan to cater for more than 175 million people^[5]. Among various hospitals, due to in-appropriate facilities, patients travel from hundreds of kilometers for the sake of basic healthcare facilities. During flood, sometimes travel to only few kilometers, is almost impossible. Pakistan again and again faced serious flood problems in major provinces, which caused hundreds of deaths and massive displacements due to sheer negligence of National Disaster Management. Many domestic animals were also infected by various diseases due to flood. Heavy flood coming from India adds to flooding misery. India released more than 170000 cusecs of water which severely damaged catchments areas of Sutlej River near Kasur, affecting hundreds of thousands of people^[6]. In Punjab, heavy rainfall swept 187000 acres of land and affected more than 165000 people in Rajanpur. In Sindh, Lyari and Malir have been seriously affected by flooding. In Khyber Pakhtunkhwa, regions heavily damaged by flash floods, in term of damaged houses, infrastructures, loss of many precious lives, water irrigation, and electricity, includes Peshawar, Bannu, Chitral, Tank and Lakki Marwat. In Balochistan, extensive damages have been reported from Jaffarabad, Hamai, Jhal Magsi, Sibi and Loralai districts^[7]. Previously

our research group identified and isolated a virulent phage (from sewerage water samples) against multiple drug resistant *Pseudomonas aeruginosa* responsible for bacteremia, respiratory system infections, gastrointestinal infections, dermatitis, soft tissue infections, urinary tract infections, bone and joint infections and a variety of systemic infections^[8]. The bacterial infections which are resistant to antibiotics can also be reduced by using bacteriophage therapy. The risk of communicable disease (including viral hepatitis A, cholera, typhoid fever, leptospirosis, malaria, West Nile fever, yellow fever, dengue and dengue haemorrhagic fever) from flooding can be reduced *via* chlorination of water to ensure safe drinking water, vaccination against hepatitis A, malaria prevention, health education and proper handling corpses. The nature contains hidden remedies against multiple diseases and there is a strong need to identify therapeutic potentials of natural entities^[9,10].

Due to heavy rainfall and river overflow, in many regions of Pakistan, standing water becomes breeding sites for mosquitoes. It has been reported that more than 21204 people were infected with dengue in November 2010 after a worst flood in Punjab^[11]. The prevalence of viral infections is unfortunately increasing day by day in developing countries due to limited awareness among the general population^[12,13]. Although a new vaccine for dengue fever has proven safe in nonhuman primates, a lot of efforts are required to supply effective vaccines at minimal cost. Up to now there is no vaccine against dengue haemorrhagic fever in Pakistan. Although the government of Pakistan took crucial steps to manage the devastating situation through organizing awareness programs at offices and educational institutes, and many spraying teams for fumigating, spraying and fogging affected areas, this problem survived for a few months due to the complexity of this issue. The dengue infection reoccurred in 2011, 2012 and 2013 due to heavy rain fall of monsoon. In Karachi on average 700, 858 and 630 deaths were reported due to dengue infections in 2010, 2011 and 2012, respectively. But in 2013 the number of deaths due to dengue has increased to 2706 cases which depict a 323.4% increase in dengue cases compared to 2012^[14]. It has been reported that allied hospitals in capital twin cities (Islamabad and Rawalpindi) of Pakistan were receiving almost 25 fresh dengue cases every day. In October 2013 it has been reported from Rawalpindi that almost 722 suspected cases have been reported since September 2013. It was further disclosed that the provincial health department was hiding the actual number of deaths only due to hiding the incompetence of the department^[15]. Mosquito sprays would not be a sufficient approach for dengue eradication, and mass awareness, larvicide and biological control by Guppy fishes are also effective strategies to overcome this problem. Lessons should be learned from our previous mistakes of poor flood management. The government of Pakistan has to cope with the ongoing impact of Pakistan's flood and the resulting displacement of populations. Each year Pakistan suffers lose water due to the absence of water

storage capacities. The water storage in deep wells and dams will not only prevent flash flood, but it will also be a positive step towards generation of electricity. There is a strong need to improve surveillance at local, national, and international levels to develop Disaster-Preparedness Programmes and Early Warning Systems. International health bodies and non-governmental organizations must take note of this alarming situation and take appropriate steps like financial/medical aid to defeat the after-effects of flood.

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