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Review

Chikungunia outbreaks in new regions as a sign of ecological ill health: Re-examining vector borne disease in the context of climate change

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The Indian capital city of Delhi reported its first ever case of Chikungunya in June 2007. However, the way this case was detected, and reported raises serious issues related to general epidemiology and disease surveillance. This incident being the first reported case of Chikungunya from the resident of Delhi also raises much larger concern of changing infectious disease dynamics. The objectives of this study are: 1) Occurrence of new disease in new area should be treated as of sign of ecological ill health. 2) Increase in frequency of outbreaks vector borne disease like Chikungunya in India could be manifestation of consequence of global warming.

Key words: Climate change, Chikungunya, global warming.

INTRODUCTION

The Indian capital city of Delhi reported its first ever case of Chikungunya in June 2007 (http://www.thehindu.com/2007/06/13/stories/2007061319780300.htm; http://209.85.175.104/search?q=cache:lBlFujLD0coJ:www.nidm.net/News%2520in%2520PDF/2007/June/13-06-07.pdf+Chikungunya+paharganj+the+hindu+2007&hl=en&ct=clnk&cd=3&gl=in; Public Health and Emergency Preparedness Bulletin, 2007), which was confirmed by the National Institute of communicable disease (NICD). This was the first reported indigenous case of Chikungunya ever detected in Delhi city. Unfortunately, the detailed clinical and demographic profile of the case was also not available, due to improper medical records by the reporting hospital. Thus it became difficult for the public health authorities to verify and confirm existence of a disease outbreak in the absence of detailed clinical as well as epidemiological correlates vis-a-vis the index case.

CASE HISTORY

In spite of an active integrated disease surveillance programme (IDSP), the first indigenous case of chikungunya in Delhi was identified at a private hospital and not a public one. The hospital had noted only the patient's name and the locality (Paharganj) from which the patient came while sending the blood sample. They had not taken the complete address of the patient. So when the NICD laboratory confirmed the diagnosis of Chikungunya, there was no way the patient could be traced back http://209.85.175.104/search?q=cache:lBlFujLD0coJ:www.nidm.net/News%2520in%2520PDF/2007/June/13-06-07.pdf+Chikungunya+paharganj+the+hindu+2007&hl=en&ct=clnk&cd=3&gl=in; http://209.85.175.104/search?q=cache:lBlFujLD0coJ:www.nidm.net/News%2520in%2520PDF/2007/June/13-06-07.pdf+Chikungunya+paharganj+the+hindu+2007&hl=en&ct=clnk&cd=3&gl=in. Hence it was difficult to figure out whether the case was an indigenous case or an imported one. Also it was difficult to re-trace the patient for a re-test or confirmation. Thus it became difficult for the public health authorities to verify and confirm existence of a disease outbreak in the absence of detailed clinical as well as epidemiological correlates vis-a-vis the index case. Against this backdrop, when the first case of a

communicable disease of epidemic potential has been detected in a locality, but the patient has no traceable throws up many ethical issues on whether or not the public health department should press the panic button, in the wake of their first ever outbreak of Chikungunya in the city without the knowledge of whether the index case was indigenous or imported case.

DISCUSSION

This incident being the first reported case of Chikungunya case from the resident of Delhi also raises much larger concern of changing Infectious disease dynamics. Any new disease in any new region where it was previously not known to occur is certainly a cause of concern, as it is an emergence of a new infectious agent in a hitherto 'virgin' region. It could be a manifestation of disturbed equilibrium in the ecology in a given region. New epidemics in new regions are a definite sign and symptom of ecological ill health.

Changing weather patterns, climatic conditions affect diseases transmitted through water and vectors (World Health Organisation, 2005). Fluctuation in the climate especially in the temperature, precipitation and humidity can influence biological organisms and the process. If the agent and reservoir are successful in the newly changed climate, the agent can be expected to multiply more rapidly, and if the reservoir is arthropod that is, mosquitoes, it too will develop more rapidly and may also have a shorter life (Shope, 1990).

The risk of explosive epidemics due to vector borne diseases is enhanced because of two main properties of the vector-virus relationship. Firstly, within limits viruses multiply more rapidly in mosquitoes at high temperatures than at low ones. Secondly, the mosquito also develops more rapidly at high temperatures than at low ones. It is important to note here that the vector for Chikungunia, the *Aedes aegepti* is widely prevalent in Delhi City, which has been responsible for many Dengu Haemorrhagic fever outbreaks in the last two decades.

This combination is conducive to a very short incubation period in the mosquito and rapid mosquito population increase. A short incubation period in the mosquito along with rapid population increase in turn can lead to more rapid and sometimes explosive transmission in the human population (World Health Organisation, 2005; Shope, 1990).

Hence, if the on going climate change can lead to ecological disturbances, it is likely to bring in changes in distribution of vector borne disease like Chikungunya and other vector borne diseases (Rajan and Deepa, 2007).

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