

CME

Epidemic and pandemic influenza preparedness and response

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Abstract

Epidemic prone diseases have potential to spread rapidly in pandemic stages. So surveillance and rapid containment is required with pharmaceutical, non pharmaceutical and infection control measures. WHO global strategy for medical education envisages young doctors will be required functioning in multi disciplinary and multi professional decision making. WHO day every year is celebrated with appropriate themes to make aware about the current scenario in health and diseases in all the member states of WHO. Dr. Krishnan, WHO Director at Head Quarter, New Delhi, has provided technical and financial assistance for conducting this C.M.E. at B. J. Medical College with objective of creating awareness about influenza pandemic occurrence and measures required to prevent it.

Key words: influenza, pandemic, surveillance

Introduction:

This C.M.E. was organized by Department of Community Medicine, B.J. Medical College, Ahmedabad, Gujarat State on 20th & 21st September, 2012. Dr. Niti Talsania, Prof of Community Medicine Dept, B.J.M.C; Ahmedabad was the C.M.E. Co-ordinator.

The topics covered are overview of influenza, planning and preparation of influenza, public health measures to reduce transmission of influenza.

Participants were post graduate residents from N.H.L. Municipal Medical College, Ahmedabad and government medical college of Baroda, Rajkot and Karamsad. WHO, Delhi sponsored this CME with the aim for capacity building of

post graduate residents regarding pandemic preparedness. Epidemiology is the branch of medicine that deals with the study of the causes, distribution, and control of disease in populations. Outbreak is a sudden, localized increase in a disease greater than the expected occurrence of that disease. Epidemic is the unusual occurrence in a community or region of disease, specific health related behaviour or other health related events clearly in excess of expected occurrence. Pandemic is an epidemic (or outbreak) occurring over a wide geographic area.

Requirements for a Pandemic¹:

Influenza has high possibility for global outbreak of disease because a) New influenza A virus emerges in humans b) there is minimal or no population immunity c) Spreads easily from person to person.

Overview of influenza²: Influenza A virus is categorized by subtype which is classified according to two surface proteins. Hemagglutinin (H) – has 16 known subtypes and Neuraminidase (N) – 9 known subtypes. Antibody to HA is protective. Antibody to NA can help modify disease severity.

Antigenic DRIFT: There is minor change in HA / NA. Point mutations occur during replication, but subtype remains the same. Since there are continuous changes, virus continues to cause illness and deaths. Limited partial immunity may exist to changed virus. So it results in the need to update vaccines annually.

Antigenic SHIFT: There is major change in HA / NA. New subtype of virus is introduced. It is caused by genetic re-assortment when 2 subtypes infect a host simultaneously or caused by direct transmission from birds or other animals to

humans. Mean incubation period is 2 – 3 days. There is high fatality rate in all groups. All ages are affected. Highest rates are in children < 5 years. Most serious complications occur in elderly.

Role and responsibilities of Rapid Response Team (RRT)³: The team has to verify any rumour of disease outbreak, carry out the outbreak investigation, propose ways to stop epidemics, initiate epidemic prevention and control and provide technical support to ministry of health. Core team members include the Team Leader, Epidemiologist, Clinical Officer, and Laboratory technician/scientist, Veterinarian or Animal Health Specialist, Social Mobilization Specialist. Expanded team members include Logisticians / Administrators, Infection control Officer, Security Officer and Communication specialist (with media).

Role of Team Leader (State and District Nodal Officer): The team leader briefs the team on the situation, outlines the investigation plans, monitors the evolution of the outbreak, assigns roles and responsibilities, oversees team member roles, communicates with media, conducts (international) reporting and communicates through fastest means of communication viz. fax, internet and email with other officials.(Epi-info and SPSS training)

Role of Epidemiologist: The epidemiologist verifies the outbreak, communicates case definition to team members, search for hidden cases and contact tracing, identifies specific control measures, social audit and supervises data collection, data analysis and documentation.

Role of Clinician: The clinician advises and assists in managing patients, Educates, implements, and supervises infection control measures, institutes case management measures, death audit, advises and assists in collection of clinical specimens from cases/patients, advises on referral in respective district hospitals.

Role of Microbiologist: The laboratory technician assures proper specimen storage and transportation after proper labeling the specimens, verify proper avian influenza laboratory diagnosis to help refine a case definition,(confirmatory diagnosis) Assess the area laboratory capability including bio-safety levels, know or devise a plan for sharing specimens with national or WHO laboratories.

Infection Control Officer: The infection control officer oversees decontamination processes, advises health units on proper infection control and performs procedures for isolation and triage of patients.

Pandemic Phases⁵

The classification of pandemic phases provides the global framework for preparedness and response. It is a six phase approach.

Phase 1 – 3: We have to strengthen pandemic influenza preparedness and response capacities at the global, regional, national, and sub-national levels. An animal or human-animal influenza reassortant virus has caused sporadic cases or small clusters of disease in people, but has not resulted in human-to human transmission sufficient to sustain community-level outbreaks.

The countries have to strengthen pandemic influenza preparedness and response capacities at the global, regional, national, and sub-national levels. An animal influenza virus circulating in domesticated or wild animals is known to have caused infection in humans and is therefore considered a specific potential pandemic threat. No animal influenza virus circulating among animals have been reported to cause infection in humans.

Phase 4: Contain the new virus within a limited area or delay its spread to gain time to implement interventions, including the use of vaccines. Human-to-human transmission of an animal or human-animal influenza reassortant virus able to sustain community-level outbreaks has been verified.

Phase 5 – 6: To reduce the impact of the pandemic on society, hence actions shift from preparedness to response at a global level. In addition to the criteria defined in Phase 5, the same virus has caused sustained community level outbreaks in at least one other country in another WHO region. To reduce the impact of the pandemic on society, hence actions shift from preparedness to response at a global level. The same identified virus has caused sustained community level outbreaks in at least two countries in one WHO region

Post Peak / Pandemic⁶: The goal of activities during the post-pandemic period is to address the long-term health and social impact of the pandemic, as well as to restore normal health and social functions. The post-pandemic period - Levels of influenza have returned to the levels seen for seasonal influenza in most countries with adequate surveillance. The overall goal of actions during the post-peak period is to address the health and social impact of the pandemic, as well as to prepare for possible future pandemic waves. Post-peak period - Levels of pandemic influenza in most countries with adequate surveillance have dropped below peak level.

WHO's roles: The important role of WHO is to coordinate international public health response under International Health Regulations. It designates the global pandemic phases, select the pandemic vaccine strain and recommend the production of the pandemic vaccine. WHO assists, upon request, to rapid containment efforts of the emerging pandemic virus. It helps national authorities in deciding the optimal response by timely assessment of pandemic severity and provision of epidemiologic, virologic and clinical characteristics of pandemic influenza to. It provides the guidance and technical assistance to Member States in their efforts to be better prepared to mitigate a future influenza pandemic.

National governments' roles: It provide leadership and coordination among different sectors of the government and for the whole-of-society to be prepared for an influenza pandemic enacting or modifying legislation where required. It plans for effective risk communication before, during and after the pandemic. The government plan for and implement all available measures in an ethical manner to mitigate the impact of the pandemic and ensure continuity of health care provision during a pandemic

Lessons learned from previous influenza pandemics⁷:“Early diagnosis and prompt treatment” (EDPT) can prevent pandemics. It is expected that the next influenza pandemic will begin anytime, anywhere, thus media involment and documentation, will alert the neighbouring states and can take future preventive actions.

Rapid Containment: Containment is Time Sensitive. Mathematical modeling indicates “window of opportunity” to act is very short. Only have ~ 3 weeks to start antiviral and public health measures after Index Cluster is detected. Detection, investigation and reporting of first cases must happen quickly.

Factors affecting Assessment⁸:

a) Biological factors-Laboratory evidence of a novel virus is critical. Certain features may suggest a newly advanced adaptation to humans like mix of avian and human genes and increased number of mutations.

b) Epidemiologic factors-Efficient and sustained human-to-human transmission such as 5 or more cases closely related in time or space and 2 or more generations of transmission. Clinical severity is not an important consideration. Early cases could be mild while severe illness is more likely to be detected.

Conditions in which containment is not recommended: Rapid containment is not recommended when novel influenza virus could not be confirmed, not operationally feasible to rapidly implement at the

necessary level, national authorities do not support the operation, virus has already spread too far and containment no longer feasible.

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