Emerging Infectious Disease:
Case Management Flow at Primary Healthcare Services

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Infectious disease remain a leading cause of mortality and morbidity. Lower respiratory infections were among the leading causes of death over worldwide (WHO, 2014). Recent years have seen the emerging and reemerging infectious disease outbreak all over the world. The definition of emerging infectious disease by Centers Disease Control USA is a new infections resulting from changes or evolution of existing organisms, known infections spreading to new geographic areas or populations, previously unrecognized infections appearing in areas undergoing ecologic transformation. Southeast Asia with it own complex biological, social, ecological, and technological processes interconnect is a hotspot for emerging infectious diseases (Coker et al. 2011).

Severe Acute Respiratory Syndrome (SARS)

SARS detected first case an Guangdong City China on November 2002. SARS has spread on 25 countries across 5 continent and affect more than 8000 people and half years killed at least 774 people and spread rapidly by air transportation, and today become a global threatened (Peiris et al. 2004). SARS are clinically severe lower respiratory disease. SARS transmission major cause of droplet transmission, aerosolization.

Middle East Respiratory Syndrome (MERS)

MERS-CoV first discovered on September 2012 in Jeddah Saudi Arabia. And it has cause of death of patient with severe pneumoniae (Hui & Peiris 2015). MERS-CoV infection has continued to be exported from the Middle East by travelers to countries in North America, Europe, and Asia. Thailand has recently become the 26th country with a confirmed case of MERS-CoV infection (WHO, 2018).

Avian Influenza (H5N1) and H7N9

April 2016, there is an influenza among China population. A new strain influenza virus was detected among human that usually less pathogenic but associated with high fatalities. A (H7N9) virus had kill 14 among 63 case (22,2%). Same fatalities but distribution is quite difference with the previous attack of H5N1. While H7N9 were dominantly attack in elderly, median age was 64 years (range 4–87), H5N1 majority were young working age adults (median:26 years; range 2–62) (Arima et al. 2013). Exposure to live poultry was a major risk factor for influenza A (H5N1) infection (Mounts et al. 1999)

Difteria

Difteria outbreak in Indonesia happen at November 2012 (data released from Public Health Emergency Operating Center- PHEOC, 2017). It had killed 40 people, 400 were hospitalized and spread on 28 province in indonesia. An this is the biggest outbreak all over the world Pulungan said on Republika 8 December 2017 . It is outbreak probably associated less immunization coverage in Indonesia, Satgas Immunization Ikatan Dokter Anak Indonesia Analyzed. Diphteria infection caused by *Corynebacterium diphtheriae and it spread through droplet transmission like coughing and sneezing (Center Disease Control)*.

Case management flow at primary healthcare services

Primary care is a first line healthcare services that should ready for any new emerging and reemerging infectious disease case. On his article titled Emerging Infectious Diseases: Implication on Primary Care (Beckett & Kumar 2015) emphasis an awareness among returner has an infection who attend primary care (figure 1).

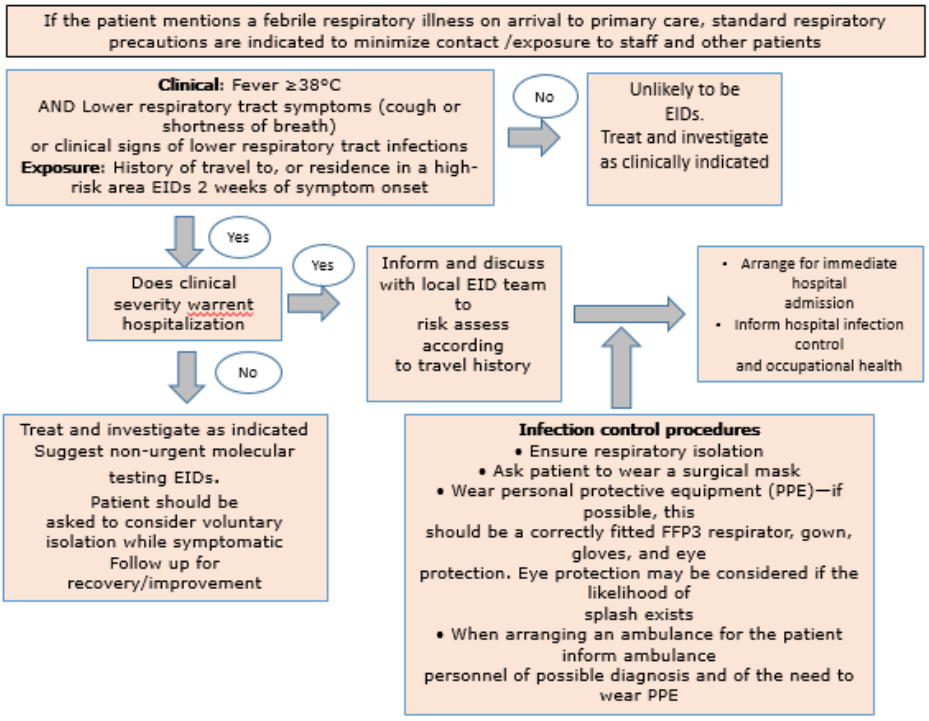

Figure 1. Emerging infectious disease case management flow in primary care.

Standar precaution and transmitted based precaution

In order to reduce spreading of any emerging infectious disease in primary care services, standar precaution and transmitted based precaution should be applied. Based on APIC Infection Prevention for Ambulatory Care Centers During Disasters, 2013 the precaution should be applied:

Hand hygiene

Hand hygiene is the cheapest weapon to prevent spreading infection in healthcare service. Hand hygiene could be a water based or alcohol handrub based. Doing hand hygiene in 6 step and five moment effective spreading healthcare associated infection (WHO Hand hygiene guideline)

Cough etiquete

Cough etiquete is an education given to all of patient and her family in order to prevent spreading infection trough droplet (cough and sneezing). Cough etiquete include using facial tissue covering nose and mouth while cough or sneeze followed by dispose the tissue in garbage basket and wash hand. If there is no facial tissue, individuals ought to cough or sneeze into the crook of their elbow or sleeve

Personal protective equipment (PPE)

PPE is gear designed to protect the wearer from exposure to microorganisms. Different diseases require different types of PPE based on how the agent is transmitted. Right sequence of donning and doffing procedures for PPE is important

Appropriate patient placement

Place patients who require Airborne Precautions in an Airborne Infection Isolation Room (AIIR) Direct exhaust of air to the outside. If it is not possible, the air may be returned to the air-handling system or adjacent spaces if all air is directed through HEPA filters. Whenever an AIIR is in use monitor air pressure daily with visual indicators (e.g. smoke tubes, flutter strips), regardless of the presence of differential pressure sensing devices (e.g. manometers). Keep the AIIR door closed when not required for entry and exit.

Disinfection and sterilization

Discard the single used consumables and clinical waste in plastic leakage preventable bag. Wear appropriate PPE to protect the performing clinical staff to prevent exposure, splash and splatter during cleansing. Use 1:49 Sodium hypochloride solution or appropriate disinfectant solution to disinfect the reusable equipments. Remove the PPE immediately after the disinfection by the performing staff

Environmental cleanliness

Environment surfaces have been considered as a source of pathogens. Bleach was a EPA recommended for environmental cleaning. During outbreaks of certain infectious organisms, such as norovirus, *C. difficile*, VRE, Bleach 1:10 dilution were recommended.

Specimen Collection, Handling, and Transport

Wear gloves, gowns, and where appropriate, masks and/or goggles or face shield when collecting specimens. Collect the specimen in a watertight and leak-proof primary containers and transport the containers within a sealable, watertight secondary container (e.g. zip-lock plastic bag), which is then put into an outer container or packaging box with biohazard warning label for transport. Decontamination of spills of blood or infectious body fluids is generally achieved by 10,000 ppm or 1 in 5 dilution of household bleach. A good preparedness of emerging infectious disease management should at least have 6 component ie: writen EIDs plan, engineering and administrative control, good education to staff and patient, vaccination, surveylance and drill management.

References

Arima, Y. et al., 2013. Human infections with avian influenza A(H7N9) virus in China: preliminary assessments of the age and sex distribution. *Western Pacific Surveillance and Response Journal*, 4(3), pp.1–3. Available at: http://ojs.wpro.who.int/ojs/index.php/wpsar/article/view/203/276.

Beckett, G. & Kumar, A., 2015. Emerging infectious diseases: Implications for primary care. *Practice Nursing*, 26(11), pp.542–545. Available at: http://www.magonlinelibrary.com/doi/10.12968/pnur.2015.26.11.542.

Coker, R.J. et al., 2011. Health in Southeast Asia 3 Emerging infectious diseases in southeast Asia: regional challenges to control. *Lancet*, 377(9765), pp.599–609.

Hui, D.S. & Peiris, M., 2015. Middle East Respiratory Syndrome (MERS). *American Journal of Respiratory and Critical Care Medicine*, 192(3), pp.278–280. Available at: http://www.cdc.gov/coronavirus/mers/.

Mounts, A.W. et al., 1999. Case-control study of risk factors for avian influenza A (H5N1) disease, Hong Kong, 1997. *J Infect Dis*, 180(2), pp.505–508. Available at: http://www.ncbi.nlm.nih.gov/pubmed/10395870.

Peiris, J.S.M., Guan, Y. & Yuen, K.Y., 2004. Severe acute respiratory syndrome. *Nature Medicine*, 10(12s), pp.S88–S97. Available at: http://www.nature.com/doifinder/10.1038/nm1143.