Taiwan Epidemiology Bulletin
Biweekly November 30 , 2010 / Vol.26 / No.24

Study on the Quality of Dengue Fever Surveillance in Taiwan Area

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Abstract

Dengue fever is one of the category 2 communicable diseases in Taiwan. The surveillance of dengue fever mainly relies on the notification by physicians who diagnosing the suspected cases, as required by the Communicable Disease Control Act. Another approach for case finding is fever screening at border entry point for detecting imported cases. Therefore, to detect dengue epidemic in time will be dependent on the immediate notification of physicians in medical institutions and a well established and operating surveillance system. To identify case at its early stage will be helpful to the action taken subsequently for disease control. This study used the data of dengue fever collected in the recent five years (2004-2008) from the National Notifiable Communicable Disease Surveillance System Database to analyze the timeliness of notification of dengue cases. The results show that 87.2% (9,209/10,563) of cases were diagnosed as suspected dengue fever within seven days after onset of symptoms and the median interval from the date of onset to the date of diagnosis was four days ; 0.4% of the total cases was not reported within the time required by the regulation ; and the median interval from the date of notification to the date of confirmation was eight days.

This study estimates that the overall notification rate of dengue fever among medical institutions during 2006-2007 was 86.6% (3,528/4,074). Data from outpatient units show that the average notification rate was 83.0％ (2,192/2,641), with the highest rate found in medical center, then, in descending order, regional hospitals, area hospitals, and clinics. The notification rate was only 47.7% (199/417) in clinics. The highest notification rate (86.6％) was found in southern Taiwan area and the lowest (42.9%) in eastern Taiwan area. Data from inpatient units indicate that the average notification rate was 95.4％ (2,428/2,545). The notification rate in different levels of hospitals (including medical center, regional hospitals, and area hospitals) was all higher than 90%. The notification rate for inpatient units was commonly higher than outpatient units in each of the administrative area.

The Taiwan Epidemiology Bulletin series of publications is published by Centers for Disease Control, Department of Health, Taiwan (R.O.C.) since Dec 15, 1984.
Publisher : Feng-Yee Chang
Editor-in-Chief : Min-Ho Lai
Executive Editor : Li-Gin Wu, Hsiu-Lan Liu
Telephone No : (02) 2395-9825
Address : No.6, Linshen S. Road, Taipei,Taiwan 100 (R.O.C.)
Website : http://teb.cdc.gov.tw/
Suggested Citation :
[Author].[Article title].Taiwan Epidemiol Bull 2010;26:[inclusive page numbers].

Keywords: dengue fever, timeliness of notification, notification rate

Introduction

Dengue fever is an infectious disease commonly seen in subtropical areas, and it is spread through the bite of infected mosquitoes. Humans infected with dengue virus may appear symptoms of fever, headache, retro-orbital pain, myalgia, arthralgia, and rash after 3-14 days incubation period. Clinically, some cases may present more serious symptoms like dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) while others may be asymptomatic. No vaccine is available for prevention of dengue fever right now, nor having effective treatment [1-2]. Therefore, the most important and effective way for preventing and controlling the disease is to clean the mosquito breeding sites, to decrease mosquito bites, to strengthen surveillance and report of suspected cases, and to take control action in time.

Dengue fever is one of the category 2 communicable diseases in Taiwan, for which, based on the stipulation of Article 39 of the Communicable Disease Control Act, physicians are required to report any cases or suspected cases to local health authorities within 24 hours after diagnosis. The monitoring of cases or suspected cases of dengue fever mainly depends on the National Notifiable Communicable Disease Surveillance System (NNCDSS) operating by Taiwan Centers for Disease Control (Taiwan CDC) and the symptomatic reporting system runs by Taiwan CDC through fever screening at border entry points [3-5]. In public health, data on health-related events should be continuously and systematically collected and analyzed, then disseminated to public, and even applied to public health practices to decrease morbidity and mortality [6-7]. Information obtained through surveillance can be used as a reference in developing public health policy, so that the resources could be allocated most effectively, and can also provide as a baseline data in epidemiological study [8]. All of these are the reasons why we are conducting surveillance on dengue fever and other important communicable diseases.

Based on the definition made by the U.S. Centers for Disease Control and Prevention, timeliness means the speed between steps working in public health surveillance system [8], including occurrence of health-related events, identification of the health-related events, notification of the health-related events to the competent public health authorities, response taken by health authorities following the receipt of the report on the events, and feedback on laboratory results to the reporters. The timeliness is commonly measured through the analysis of

time interval spent between the steps in the surveillance system. Usually, the time interval between the occurrence of health-related events and the notification of the events to health authorities will be measured firstly.

The scenario from occurrence to confirmation of dengue cases is shown in Figure 1, people infected with dengue virus may become sick after incubation period, and then they may be diagnosed as suspected cases and, based on the Communicable Disease Control Act, be reported to Taiwan CDC within 24 hours after diagnosis, at the same time, blood specimen collected from the patients will be sent to Taiwan CDC, and finally be confirmed as a dengue cases. In order to know the timeliness of the whole notification process, the time interval between steps of the process was calculated. The time interval from the date of onset to the date of diagnosis will provide information about how much time will be spent for a patient to seek medical service and be diagnosed as suspected dengue case after onset of the disease. The interval from the date of diagnosis to the date of notification can offer message on whether the physician has delayed the notification. The interval from the date of notification to the date of confirmation represents the time spent for making confirmation following the notification.

In addition, notification rate was calculated by dividing the number of dengue cases reported to the NNCDSS by the number of cases that were diagnosed as dengue fever in the National Health Insurance Database (NHID).

Materials and Methods

A. Timeliness of notification

Data on cases diagnosed as suspected dengue fever in the NNCDSS with the date of onset between 2004 and 2008 were collected and analyzed. The timeliness in different stages of the surveillance process was compared for different administrative regions and for different notification hospitals, including disease onset, diagnosis, notification, and confirmation.

Microsoft Office Excel 2003 was used to analyze the difference of timeliness among different administrative regions. The administrative regions were classified as follows:

1. Taipei area: Taipei City, Taipei County, Ilan County, Keelung City, Kinmen County , and Lianjiang County.
2. Northern Taiwan area: Taoyuan County , Hsinchu City, Hsinchu County, and Miaoli County.
3. Central Taiwan area: Taichung City, Taichung County, Zhanghua County, and Nantou County.
4. Southern Taiwan area: Tainan City, Tainan County, Jiayi County, Jiayi City, and Yunlin County.
5. Kaohsiung & Pingtung area: Kaohsiung City, Kaohsiung County, Pingtung County , and Penghu County.
6. Eastern Taiwan area: Hualian County and Taitung County.

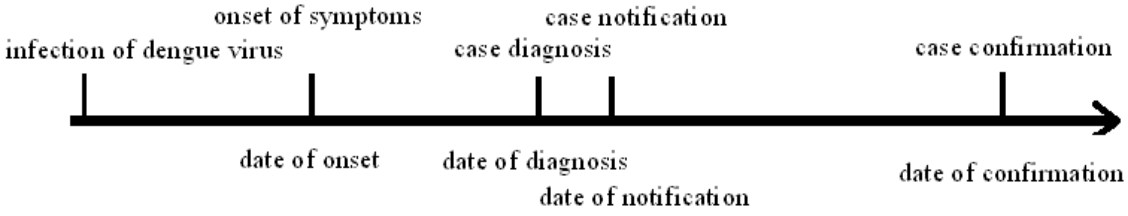

Figure 1. Timeline from occurrence to confirmation of dengue cases in Taiwan

B. Notification rate

Since hospitals will routinely submit application to the Bureau of National Health Insurance for insurance payment on all visited patients but they may fail to report a patient diagnosed as case of Notifiable Communicable Disease, such as dengue fever, to local health authorities, hence, the number of cases diagnosed as dengue fever and claimed for insurance payment during 2006-2007 in the NHID was chosen as the denominator of the notification rate. This includes outpatients who were coded as dengue fever (disease code 061) to the item of International Classification of Disease in the Outpatient Prescription & Treatment Specification File, and hospitalized patients who were coded as dengue fever at the items of the Primary Diagnosis or the Secondary Diagnosis in the Inpatient Medical Charge Specification File. The ID number of the patients was used to merge data of the same patients claimed by different hospitals. Numerator of the notification rate was the number of cases who were reported as dengue fever in the NNCDSS. The notification rate, then, was calculated for each of the administrative areas and for each of the insurance contracted hospitals, in different levels, and clinics.

Since the NHID is divided into outpatient and inpatient files, and dengue cases may be identified either during clinic visit or during hospitalization, data of the cases were obtained from both parts. ID number of the cases and code number of the medical institutions were used to double check data obtained from the NHID and the NNCDSS (cases had been in two different hospitals were considered as two events) to count the number of numerator and denominator of the notification rate. Then, notification rate for hospital or clinic was calculated and a further analysis of notification rate for inpatient unit and outpatient unit was performed.

Results

A. Timeliness of notification

A total of 10,563 cases of dengue fever with onset during 2004-2008 were reported in Taiwan, of whom 5,812 cases (55%) were male and 4,751 cases (45%) were female. The majority of cases were in the 15-64 years age group, accounted for 76.6% (8,097), followed by over 65 years age group and 0-14 years age group, 13.7% (1,444) and 9.7% (1,022), respectively.

1. Timeliness of diagnosis: The time interval from the date of onset to the date of diagnosis was ≦ 7 days in 87.2% of cases, and the median time interval for total cases was four days (Table 1).

Table 1. Time interval between onset and diagnosis of dengue cases with onset during 2004-2008, by residential areas

Residential areas	Time interval between onset and diagnosis ≦7 days（%）	Number of cases	Median time interval (days)
Taipei area	80.1	880	4
Northern Taiwan area	83.7	355	4
Central Taiwan area	81.9	382	4
Southern Taiwan area	89.2	3,338	4
Kaohsiung & Pingtung area	87.8	5,545	4
Eastern Taiwan area	74.6	63	5
Total	87.2	10563	4

2. Timeliness of notification: The time interval from the date of diagnosis to the date of notification to Taiwan CDC was divided into zero day, one day, and over one day for analytical purposes. The result shows that a 0.4% (43 cases) of the total cases was not reported within the time required by the Communicable Disease Control Act. This means that the majority of physicians have met the requirements by law in terms of the case notification.
3. Timeliness of confirmation: The time interval from the date of notification to the date of confirmation was analyzed to evaluate the timeliness of laboratory test and laboratory-based case confirmation. Therefore, cases without specimen were not included in the analysis. The results show that the median time interval was eight days for total cases, and areas in northern and southern Taiwan had a shorter median time interval, one day and three days, respectively; and Taipei area and central Taiwan area had a longer median time interval, fourteen and seventeen days, respectively (Table 2).

B. Notification rate

After merging data of cases by ID number, there are 4,074 cases that were diagnosed as dengue fever during 2006-2007 based on the NHID. Of these, 3,528 cases have been reported and registered in the NNCDSS and 546 cases have not been reported. The number of cases reported from outpatient units and inpatient units were 3,659 and 2,601, respectively. The data shows that some cases have been repeatedly reported as dengue fever more than five times within three months or twelve times during a ten-month period. After merging data of cases by ID number and medical institutions, the number of cases reported from outpatient units and inpatient units were 2,641 and 2,545, respectively. Number of dengue cases notified by outpatient units and inpatient units are shown in Table 3.

Table 2. Time interval between notification and confirmation of dengue cases with onset during 2004-2008, by notification areas

Notification areas	Number and percentage of cases with a time interval between notification and confirmation ≦14 days		Sub-total number of cases	Median time interval (days)
	Number	%		
Taipei area	350	52.6	665	14
Northern Taiwan area	390	76.2	512	1
Central Taiwan area	124	38.6	321	17
Southern Taiwan area	2,215	79.9	2,771	3
Kaohsiung & Pingtung area	3,477	72.5	4,799	9
Eastern Taiwan area	30	65.2	46	11
Total	6,586	72.3	9,114	8

Table 3. Notification rate of dengue cases during 2006-2007, by sources of notification

Source of notification	Number of cases reported	Number of cases occurred	Notification rate (%)
Outpatient units			
Levels of medical institutions			
Medical center	993	1,034	96.0
Regional hospital	823	938	87.7
District hospital	177	252	70.2
Clinic	199	417	47.7
Administrative areas			
Taipei area	50	63	79.4
Northern Taiwan area	29	36	80.6
Central Taiwan area	26	34	76.5
Southern Taiwan area	1,195	1,380	86.6
Kaohsiung & Pingtung area	889	1,121	79.3
Eastern Taiwan area	3	7	42.9
Total	2,192	2,641	83.0
Inpatient units			
Levels of medical institutions			
Medical center	1,021	1,070	95.4
Regional hospital	1,158	1,210	95.7
District hospital	249	265	94.0
Administrative areas			
Taipei area	57	60	95.0
Northern Taiwan area	27	27	100.0
Central Taiwan area	34	39	87.2
Southern Taiwan area	1,388	1,451	95.7
Kaohsiung & Pingtung area	915	959	95.4
Eastern Taiwan area	7	9	77.8
Total	2,428	2,545	95.4

Discussions

Although some dengue cases may appear serious symptoms, others are asymptomatic. Adding that the perception about symptoms depends on personal sensitivity, not every case will immediately seek medical service when they get sick or be detected in time through quarantine fever screen at border entry points. Based on the NNCDSS database, the ratio of male to female dengue cases occurred during the recent five year period (2004-2008) was 11:9, most cases are in young and middle age group, and the time interval between the date of onset and the date of diagnosis was $\leqq$7 days for 87.2% cases, with a median time interval of four days. This represents that the majority of suspected dengue cases were diagnosed within one week

after onset. The analysis on timeliness of onset to diagnosis in different administrative areas shows that the median time interval is five days in eastern Taiwan area, higher than other areas, and the percentage (74.6%) of cases diagnosed within seven days after onset is lower than other areas. The results are probably caused by scarcity of medical resources in the eastern area. In contrast, in southern Taiwan area and Kaohsiung & Pingtung area where the dengue fever epidemic frequently occurred, because residents may have a higher vigilance to the infection of dengue fever, a higher percentage of dengue cases diagnosed within seven days from the date of disease onset are found in these areas.

Although the analysis shows that most of the physicians have reported cases within the time period required by the Communicable Disease Control Act, the analysis was conducted based on the notification date recorded by the reporters in the notification sheet. Whether the reporters have honestly filled in the date of notification needs to be further explored. Since the time interval spent between the date of notification and the date of confirmation was too long or unreasonable in some cases, the median time interval instead of the mean value, eight days, was used for analysis

Previous study used data in the NHID and the NNCDSS database to conduct analysis of notification rate [13]. However, the notification rate was directly calculated by dividing the number of cases from NNCDSS database by the number of cases from NHID, not considering the issue if the cases in the two data bases are the same person. In this study, ID number was used to check and merge data so a more reliable notification rate should have been obtained. Once the dengue code is given to a patient in the NHID for applying insurance payment, the patient is considered as a suspected dengue case and the physician shall report to Taiwan CDC on the diagnosed case within the required time period for the purpose of disease control. Nevertheless, some cases that are not applying insurance payment may not be contained in the Database, such as cases that pay medical fee by their own or cases that are not applying insurance payment but reported as suspected dengue cases in the NNCDSS database. Therefore, these cases were not included in this study since the data, including outpatient and inpatient cases, for analysis all came from the NHID that covered only cases with diagnosis of suspected dengue cases. Moreover, although data of cases with multiple records in the Database have been merged by ID number, it is difficult to make sure whether the medical record for whom visited several times at clinic over a long period of time belongs to the same disease course. Therefore, the notification rate obtained in this study is unable to fully reflect the real notification rate in Taiwan.

Data from outpatient unit show that an apparently different notification rate exists among different level of insurance contracted hospitals or clinics, which the highest rate is found in medical center, then, in descending order, regional hospitals, district hospitals, and clinics. The notification rate is only 47.7% in clinics. In contrast, data from inpatient unit indicates that the notification rate among hospitals reaches as high as 90 percent. These

results reveal that the notification of suspected dengue cases is not good among primary care clinics. The difference of notification rate between hospitals and clinics may result from the difference of personnel working for notification and available resources. In large hospitals (such as medical center and regional hospital), the report of notifiable communicable disease is performed by specific personnel in Infection Control Unit of the hospital when the cases may not be directly notified by physicians diagnosing the disease. In primary care clinics, the notification can only be conducted by physicians diagnosing the disease or other medical personnel through internet or fax transmission, in this case, the physicians and other medical personnel may fail to report because of ignorance of notification requirement. In addition, the primary care clinic may not have computer facility and the notification must be completed through duplicate medical record written by hand. These inconvenient procedures may also become one of the reasons decreasing the notification rate. Doyle et al. reported that reasons for failure to notify by physicians in the USA included ignoring that notification is a regulatory requirement, not knowing what disease shall be reported, not knowing how to notify and where to notify, assuming that somebody else would notify, intent to protect patients' privacy, no incentive or punishment to notification [9]. The main reasons leading to a decreased notification rate is ignorance about the regulatory requirement of notification and unawareness of the importance of notification on disease control [10-11]. In a study about the reasons of low notification rate, Konowitz et al. reported that most of the physicians knew what the notifiable communicable diseases are, but only 30% of them thought that they knew how to notify the diseases, and only 40% of the physicians knowing how to notify the disease in a correct notification procedure [12]. The main reasons for failure to undertake the notification in Taiwan contained worrying about violating patients' privacy, too busy and a complicated notification procedure, and being unsure if the disease diagnosed shall be notified [13]. A questionnaire survey showed that 65.2% of the physicians thought that simplifying notification procedures will enhance their willingness to report [13], but 80% of the physicians opposed strict enforcement of the Communicable Disease Control Act and punishment on physicians who violating the regulation. The physicians thought that punishing the physicians violating the regulation before teaching them about the regulation is an abusive behavior toward them. Therefore, it is necessary to strengthen education and dissemination of the regulations to physicians [14]. In addition, physicians in Taiwan expressed that their most favorite notification way is directly working through telephone [13].

Therefore, to enhance physicians' awareness of the regulations about the responsibility of reporting when they diagnose a suspected communicable disease is required by law and to evaluate the simplification and convenience of the notification procedures, such as possibility of telephone notification and establishment of relevant working mechanism, are all the focuses that should be emphasized most in terms of enhancing notification rate, and are worthy of further exploration.

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Nosocomial Cluster Infection of Novel Influenza A (H1N1) in a Hospital in Taipei City, 2009

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Abstract

In late August 2009, a cluster infection of influenza A was reported with 11 health care workers (2 nursing students, 2 physicians and 7 nursing staffs) and 2 inpatients infected in a hospital ward in Taipei City. One of them was laboratory-confirmed novel influenza A

(H1N1) infection and 4 health care workers were tested positive for influenza A on rapid test. Since most cases contracted influenza A in the same hospital, it is considered as a nosocomial cluster infection of novel influenza A (H1N1). With regard to the global influenza A (H1N1) pandemic and subsequent cluster infection in hospitals, the health authorities need to prepare well and implement infection control in healthcare facilities, strengthen hygiene etiquette, and flexibly adjust the hospital workforce as soon as possible.

Keywords: novel influenza A (H1N1), nosocomial infection, cluster infection

Introduction

The first case of novel influenza A (H1N1) was reported in Mexico in April 2009, and soon evoked a global alert. According to the statistics of World Health Organization (WHO), this novel disease has spread across the world since emerging in Mexico and America in late April. Furthermore, fatal cases were reported as the incidence of disease continued to increase [1-3]. In Taiwan, we used “Border Control” as a major strategy to avoid disease transmission since April 2009, and only few cases were reported. However, WHO raised the level of influenza A (H1N1) pandemic alert to Phase 6 and classified the severity as moderate on 11 June 2009. Because the virus is already widespread, we changed our strategy to emphasize on taking care of patients and providing information of self-protection. The Taiwan Centers for Disease Control (Taiwan CDC) indicated there were 2 samples, for the first time, tested positive for influenza A (H1N1) in July 2009 in the Community Virus Surveillance Program. It is estimated that the virus has possibly entered the community as early as one month ago and, later, would cause illness at schools in September, as students come back to schools when schools start. Then both of mild cases and inpatient cases would increase. Consequently, cluster outbreak of nosocomial infection would occur in hospitals.

First Branch of CDC was notified from the Department of Health, Taipei City Government, of an influenza A cluster infection in Ward A of a hospital. A total of 11 health care workers (2 nursing students, 2 physicians and 7 nursing staffs) and 2 inpatients presented with influenza-like symptoms. One of them was confirmed by Kunyang laboratory of CDC as novel influenza A (H1N1) infection and 4 health care workers were tested positive for influenza A on rapid diagnostic test. Since most cases contracted influenza A in the same hospital, it is considered as a nosocomial cluster infection of novel influenza A (H1N1).

Investigation for cluster infection

A 45-year-old female patient (Case 1) with end stage renal disease on regular hemodialysis for years was diagnosed with pneumonia and was admitted to Ward A Bed 11-1, which is a triple room in a 32 beds ward, for antibiotic

treatment and hemodialysis on August 5. On August 11, she presented with fever, cough and muscle soreness. The doctor has adjusted the antibiotic but the symptoms were not improved. Chest X-Ray on August 15-16 showed acute respiratory distress syndrome (ARDS) and the rapid diagnostic test was positive for influenza A on August 16. As a result, she was reported as a “severe complicated influenza case”. The second hospitalized patient (Case 2) was admitted to the same ward for nephritis treatment and was discharged home on August 15. He presented to the emergency department on August 18 because of fever and returned home after treatment.

On the same day of August 11, the health care workers of Ward A began to present symptoms of fever and cough. The hospital immediately implemented an investigation and notified Department of Health, Taipei City Government. There were total 43 health care workers at Ward A, including 18 nursing staffs, 10 physicians, and 15 administrative officers and nursing students. The medical staffs worked on a three-shift schedule to take care of Case 1 and Case 2. On August 11, 2 nursing staffs presented symptoms of fever, cough, chillness and muscle soreness. After that, 2 staffs on August 12, another 2 on August 13, and 5 on August 14, also presented influenza-like illness symptoms respectively. There were total 11 health care workers (2 nursing students, 2 physicians and 7 nursing staffs) had onset of influenza-like symptoms, and all of them have ever taken care of Case 1 and Case 2 at Ward A. The rapid diagnostic test had been done on 4 health care workers and the results were positive for Influenza A.

As for the 2 nursing staffs whose onset date was August 11, one of them daily commuted between Taoyuan and hospital by train. The other commuted by MRT to work. The preliminary conclusion was that the sources of infection for these 2 nursing staffs were not from the hospital but possibly from public transportation or community. Kunyang laboratory of CDC confirmed Case 1 as novel influenza A （H1N1）infection on August 16. These two affected nursing staff had already had influenza-like symptoms when Case 1 felt ill on August 11. Therefore, Case 1 was not the infection source. While Case 1 was hospitalizing, she could walk freely by herself and went out for meals every day. There could be other source of infection. Moreover, Case 1 received regular peritoneal dialysis treatment three times a week in the hospital. Following investigation revealed no person with influenza-like symptoms was found in the Hemodialysis room, but 4 persons were found in Continuous Ambulatory Peritoneal Dialysis (CAPD) room. The onset dates were August 11(one family member and one staff), August 14 (one staff), and 15 (one staff) respectively. The rapid diagnostic test showed influenza A positive results for those 2 persons on August 11. Because of the same onset date on August 11, the 2 positive cases of CAPD room were irrelevant to the cluster infection of Ward A.

As a result, the infection source of novel influenza A （H1N1） cluster

infection at Ward A should be caused by community acquired infection outside the hospital.

Control Measures

The hospital followed the stipulated "Procedure for Cluster Influenza Infection" and "Control Measures for Influenza A (H1N1) "with implementation of standard precautions. The emergency response, infection control, as well as experts and related resources of the hospital were adequate and an emergency management has immediately been carried out after the breakout under hospital executive's direction. Therefore, the health bureau did not intervene. From August 17, the antiviral medications were given to 45 persons (18 nursing staffs, 10 physicians, 15 administrative officers and nursing students, and two patients who were in the same room with Case 1) at Ward A. Of which 11 persons were given as treatment (2 pills a day, for 5 days to August 21), and the other 34 persons as prophylaxis (1 pill a day, for 10days to August 26). Moreover, to avoid the infection among health care workers affecting the patient care, all hospital personnel presenting with influenza symptoms would be asked to stop work. The date of returning to work depends on following conditions: the ones whose rapid diagnostic test was positive for influenza A should be off duty until five days after the onset and with symptoms relieved; the ones whose rapid diagnostic test were negative should be off duty until one day after antiviral treatment and fever subsided. In addition, some measures are needed to be implemented such as: improve the hand hygiene for health care workers and patients, practice respiratory hygiene and cough etiquette, wear surgical masks for all health care workers, limit visitor entry to the facility, strengthen the health education for visitors and caregivers, and use face masks for all caregivers.

Besides, daily environmental disinfection with bleach has been performed in Ward A and CAPD room since August 16. Active health surveillance on all the health care workers, patients and caregivers was reported to the infection control center of hospital every day from August 10 to 16 and one-week telephone tracking of the health status for discharged patients of Ward A has been done as well. In order to assess the severity of the cluster infection, the rapid diagnostic test would be performed whenever a new case with influenza-like symptoms appeared. The antiviral medication would be given no matter the result was positive or negative for infection control. After one week of monitoring, no more new case with severe complication or hospitalized was found in this nosocomial infection event.

Suggestions

With the experience of this event, some suggestions for the nosocomial cluster infection of novel influenza A (H1N1) are as follows:

A. Infection among the health care workers will affect the patient care in hospitals. Therefore, the hospital authority needs to prepare well and flexibly adjust the hospital workforce as soon as possible [4].

B. The executives should strengthen the respiratory hygiene, cough etiquette, hand washing practice and “general hand-washing spots” in hospital.

C. Visitor should be informed about the possible risks of infection and related health instructions. For example, people with respiratory symptoms are not suitable to visit patients in hospital. Visitors should wash hands after visiting the hospital as soon as possible.

D. When cluster infection occurs in a certain section of hospital, it has to be reported and managed, followed by implementation of environment disinfection and route control [5].

E. To avoid lack of medical resources due to the pandemic, mild cases are suggested to stay home, take medication on time and monitor health condition by themselves.

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