

The Situation of Infection Control in Hospitals and Search for Ways to Improve It – Focusing on the MERS Outbreak –

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Abstract

The MERS outbreak should work as motive to accurately diagnose and change the weaknesses of the Korean medical system and hospitals.

To improve emergency room resembling traditional marketplace, the law and ordinance related with establishment of emergency room should be changed to order hospitals over certain levels to be equipped with infection facilities and patient management rules equivalent to those of advanced countries. And emergency rooms of such hospitals should be required to allocate infection-specializing doctors and nurses.

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On the other hand, in this globalized world, the occurrence and spread of infectious diseases are also global. Thus, it is worth considering establishment of infectious disease-specializing hospitals.

Keywords: MERS, medical system, infection control, Korean hospitals

I. INTRODUCTION

Middle East Respiratory Syndrome is severe acute respiratory infection caused by Mers-CoV [1]. It started in Middle East in December 2012, and spread to 27 countries including Korea [2]. Main symptoms of Middle East Respiratory Syndrome are fever, cough, and difficulty in breathing, and it can cause even death [1].

As of July 4, 2016, 1,760 persons worldwide had been diagnosed as having the Middle East Respiratory Syndrome, and 630 among them had died of the syndrome. In Korea, on May 20, 2015, the first Middle East Respiratory Syndrome patient was diagnosed, having subsequently spread rapidly, and, at the above time point, 186 in total were diagnosed as contracting the syndrome with 38 having been dead of the syndrome, and, at around the time, 16,752 were released from

quarantine. Among those who contracted the syndrome in Korea, 39 (21%) were working in hospitals, with 15 (8.1%) being nurses [3].

After the first patient of MERS in Korea was identified on May 20, 2015 [4], the number of patients increased to 186 by October 2015, and with 36 (19.4%) had died of the syndrome [5]. On July 28, 2015, the government announced that there had been no new patient after July 4, that the last person under quarantine was released from the situation on 27 24:00, and that the spread of MERS actually ended [6], and it announced how it would control if MERS broke out again. It was 69 days after MERS was first diagnosed on May 20, 2015.

Meanwhile, the Western Pacific Regional Organization (WPRO) of World Health Organization (WHO) located in Manila, the Philippines, announced on July 28, 2015 through its home page that MERS in Korea was controlled with strengthened public health measures [7]. And, the official announcement of the end of the MERS outbreak would be made at the time when 28 days, the two times of the maximum incubation period of the MERS virus have passed as recommended by WTO. On October 29, 2015 24:00 the time when 28 days passed after the person infected with the virus was administered with immunosuppressive agent on October 2, 2015 was judged as MERS negative in two subsequent tests, would be the day when MERS ends [5].

As described above, MERS spread more rapidly, and in a wider scale in Korea than in other countries. The reason for it can be found in the failure of prevention of infection by the mistakes in initial response. But, what worked more greatly can be found in the infection control practices in Korean hospitals and wrong culture of using medical facilities which served as great host of MERS. The MERS case of 2015 can be called the human disaster caused by the Korean public health and medical system vulnerable to infectious diseases. In other words, unless the vulnerability of the Korean public health and medical system is not solved, such an accident can be repeated [8].

Thus, this research examines the problems in nosocomial infection control of Korean hospitals and wrong medical culture, and wants to offer a solution of it.

II. THE PROBLEMS OF NOSOCOMICAL INFECTION CONTROL AND WRONG MEDICAL CULTURE WHICH AGGRAVATED THE MERS OUTBREAK

In the MERS outbreak, infection in emergency room was the first channel of its spread. The Korean emergency room infection control system leading to overpopulation of emergency room caused by beds with less than 1m space between them, excessive staying period in emergency room, and the care of patients by their family members boosted the spread of MERS infection. The Korean medical culture where patients do 'hospital shopping', the custom of visiting multiple hospitals to treat a disease, also played a role in spreading the virus.

Such a problem of infection in hospital had been a long problem in the Korean medical area. After the MERS outbreak, Ministry of Public Health and Welfare started to tackle the overpopulation of emergency room, and inspected the situation of 415 emergency medical facilities across the country from July 2014 to last May. It found out that values of the overpopulation index of 11 emergency rooms passed 100%, reaching as high as 175.2% in the case of the emergency room of Seoul National University Hospital.

The average value of top 20 overpopulated emergency rooms was 108%, higher than the previous year [9]. In practice, lack of beds in many emergency rooms of university hospitals forced them to use cots and chairs of waiting room. In extreme cases, treatment is done on the floor of emergency room. After MERS outbreak, the classification system of emergency patients were more ramified, and made patients with light diseases pay heavily if they used emergency room. But, such measures have been criticized as not very realistic because there is no way to force the system if patients protest against it

Nosocomical infection not only damages patients, but boosts overall medical cost. In America, it is revealed that nosocomical infection generates additional medical cost reaching about 10 billion dollars every year. Major nosocomical infections in Korea are infection in surgery area, respirator-related pneumonia, central venous catheter-related blood stream infection and urinary tract infection, etc. The rate of nosocomical infections in Korea is 3.7-15.5%. It was found that one case of nosocomical infection extends additional 12 days in hospitalization period, and raises treatment fees by .65-6.36 million won. Medical fees wasted for nosocomical infection are estimated to reach from 33 billion to 1.6 trillion won [10].

Under the current medical system in Korea, as nosocomical infection control is only a matter of recommendation, there is no discrimination against the hospitals which do not adopt nosocomical infection control. The hospitals which perform such controls need to burden additional expenses. Compensation for personal and physical resources needed for infection control is too low, and the public health authorities only force them to build infection control room and hiring of infection-specializing employees

III. A WAY TO IMPROVE THE MEDICAL SYSTEM TO STRENGTHEN INFECTION CONTROL

To improve the vulnerable medical system revealed by the MERS breakout, it is necessary to strengthen nosocomical infection control, solve the problem of overpopulation of emergency room, and change the wrong medical culture like patient care culture through continuous education and publicity to the people

To strengthen nosocomical infection control, public health authorities should provide hospitals with conditions for infection control. It should strengthen compensation for manpower and resources to prevent occurrence of infection in medical activities, and financially support the expenses for using quarantine rooms in general care unit, emergency room, and intensive care unit to help hospitals control infection by themselves [11].

First, it is necessary to strengthen the requirements for nosocomical infection control by revising the Medical Law. The current Korean Medical Law stipulates that, if a clinic or general hospital with more than 200 beds runs intensive care unit, it should set up infection control room, and have one or more workers specializing infection control (Article 47 of the Medical Law; Articles 43 and 46 of the relevant ordinance of the Medical Law).

The American Infection Control Specialists Association recommends hospitals to allocate 0.8-1.0 person in charge of infection control for 100 beds. In contrast, Korean hospitals allocate 0.25 worker in charge of infection control for 100 beds. So, the manpower for such duty is very short. To reduce nosocomical infection, it is necessary to expand the manpower in charge of infection control by revising the Medical Law.

Second, to allure hospitals to invest and strengthen the existing investment in infection control, it is necessary to raise infection control fee to a great extent. Currently in Korea, infection control fee is about 4,410 per one hospitalized patient. The fee is too cheap considering the economic level of Korea, and it does not include various medical treatments and basic disposables for infection control. Infection control fee was newly adopted while Korea was experiencing new species of influenza in 2009. The fee can be claimed only once by a hospitalized patient during the period of 30 days of hospitalization. If the patient is hospitalized for 10 days, it amounts to 4 million won.

Alcohol gel for hand sterilization is kept in each ward not to mention intensive care unit and surgery room. But, there is no support for its expenses. In university hospital, the alcohol gel costs over 100 million won a year. Only if infection control fee is raised to a great extent in consideration of basic disposables to control infection and labor cost, proper infection control in hospital can be realized [12].

Third, emergency room overpopulation should be improved. Emergency room of a big hospital is a market place where patients with fever, patients on the waiting list of hospitalization, and emergency patients with heavy/light symptoms are mixed together. The causes of emergency room overpopulation can be divided into input factor, process factor, and output factor. Overpopulation by input factor is caused by

too many emergency patients compared with the treatment capacity of emergency room. It is from seasonal factors like increase of patients with light symptoms, increase of seriousness of patients, and outbreak of influenza. Overpopulation by process factor is caused by shortage of emergency room man power and increase of tests and treatments. Overpopulation by output factor is caused by lack of beds and increase of patients on the waiting list of hospitalization. Both in Korea and foreign countries, it is known that overpopulation by output factor is the most important factor. To revise emergency room overpopulation by the management of output factor, it is necessary to adopt the following means: additional fee system for charges of emergency patients, observation bed or hallway protocol to accommodate patients on the waiting list of hospitalization, and the means to link emergency room overpopulation index and gradation of emergency treatment fees. Additional fee system for charges of emergency patients can compensate for the cost of patients with severe symptoms and the situation where emergency hospitalization lowers the treatment productivity of hospital. Hallway protocol which sends emergency patients to the general ward even if there are no extra beds in the case of emergency room overpopulation is effectively used in America, etc.

Forth, patient care culture and visit in sickbed culture should be changed. About 40% of those who contracted MERS virus were family members of patients, or caregivers. The government, as part of the policy to strengthen benefits of public health insurance, has tried to expand the comprehensive nursing service which replaces existing private care-giving service with nursing service by hospital itself. However, the MERS outbreak leads us to change the existing comprehensive nursing service to strengthen benefits of public health insurance into what can reduce nosocomial infection. To achieve it, the objects of the comprehensive nursing service project should all the hospitals including high-level hospitals where patients with severe symptoms are more likely to be hospitalized.

And, if the comprehensive nursing service is expanded to high-level general hospitals, the number of nurses should be increased to a great extent. The number of nurses in hospitals including high-level general hospitals in Korea is very low compared with that of other foreign countries, which can cause damage to treatment results of patients. The ratio of nurse-patients in high-level general hospitals should be 1:4-1:8. In addition, the Korean culture of visiting sickbed patients should be changed. Infants, pregnant women, and the elderly who are vulnerable to infection should avoid visiting sickbed patients, and visitors should keep visiting hours and should not stay long in hospital. To change the custom of using medical facilities, the government and medical groups should do campaigns to the people. The government should support such campaigns performed by medical groups. In the area closely related with guidelines operating medical organizations, there should be joint efforts to change such guidelines.

Fifth, to respond to infectious diseases, infectious disease-specializing hospitals should be established. At the high-level meeting of Global Health Security Agenda (GHSA) in Seoul on September 8, 2015, President Park Geun-hae proclaimed that the government would run infectious disease-specializing

hospital per regions of Korea. But, designation, operation, and establishment of such hospitals are different problems. To prepare for the situation where new infectious diseases emerge simultaneously, and to secure national capacity to do researches and treatment of such diseases, additional discussions are necessary [13].

IV. CONCLUSION

The MERS outbreak revealed the dark reality of the situation of infection control in Korean hospitals. It starkly showed how vulnerable the Korean medical system and hospitals are to infection. The MERS outbreak should work as motive to accurately diagnose and change the weaknesses of the Korean medical system and hospitals. Otherwise, such an accident like the MERS outbreak will repeat and many people will die, and throw the country into a panic state. What is the most urgent is revision of emergency room of big hospitals. Emergency room where more than 100 patients are packed, and patients who can infect others are left alone without being quarantined is vulnerable to all the infections including SARS, new influenza, and super bacteria as well as MERS.

To improve emergency room resembling traditional marketplace, the law and ordinance related with establishment of emergency room should be changed to order hospitals over certain levels to be equipped with infection facilities and patient management rules equivalent to those of advanced countries. And emergency rooms of such hospitals should be required to allocate infection-specializing doctors and nurses.

To realize such goals, the medical charges should be raised to some extent, and other incentives should be given to help such hospitals to be equipped with facilities and manpower suitable to conditions and terms of the law. In addition, hospitals over certain levels need to implement comprehensive nursing system as quickly as possible, minimizing the necessity of family members caring patients. And, it is also necessary to revise the procedure of using the second and the third hospitals to restrain patients from unnecessarily using high-level hospitals.

On the other hand, in this globalized world, the occurrence and spread of infectious diseases are also global. Thus, it is worth considering establishment of infectious disease-specializing hospitals. To realize it, public health authorities need to revise systems on using public health and medical facilities into more practical and efficient ones and do promotion activities.

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