

Impact of Severe Acute Respiratory Syndrome on Disaster Preparedness of Emergency Response Hospitals

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Abstract

To further understand whether the response planning has also adjusted to the response plans for SARS or other biological events, we evaluated the disaster response plans from emergency response hospitals in Taipei to elucidate the impact of SARS on the planning. We reviewed disaster response plans from 52 emergency response hospitals in Taipei in 2004 according to a checklist modified from ASTHO checklist. All the 52 (100%) emergency response hospitals had response plans for SARS, whereas there were merely 2 (4%) that had general response plan for all biological events including bioterrorism ($P < 0.001$). The overall average of these plans is 15 ± 8 points. The least achieved targets include the epidemic plan addresses Worker's Compensation and Unemployment Compensation issues related to health care and other workers missing work because of isolation or quarantine and that the authority has identified deficiencies in laws and procedures on quarantine, isolation and related capacities and initiated steps to have those deficiencies corrected. The average score was significantly higher in 8 tertiary centers than in other hospitals (20 ± 4 vs. 12 ± 9 , $P < 0.01$). The only two general plans for all biological events have gained 22 and 21 points, respectively. Our survey demonstrated that most of emergency response hospitals do not take into consideration the financial and legislative problems in their SARS response plans although all of them do have such plans. This observation may imply that most of the disaster response plans in Taiwan still emphasize crisis management instead of consequence management. (*Ann Disaster Med.* 2004;3:38-45)

Key words: Biological Event; SARS; Disaster Response; Hospitals

Introduction

Disaster is a state of demand-supply imbalance. Traditional classification includes natural, man-made and mixed types of disasters. There has been a major global outbreak of SARS last

year.¹⁻⁴ Although the confirmatory tests such as polymerase chain reaction and measurements of coronavirus antibody have been undergone in many laboratories,⁵ they still cannot provide instant and correct information for clinicians at

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the first moment. The WHO criteria may help screen the suspected and probable cases,⁶ but the low specificity may indicate the lacking of cost-effectiveness in an endemic area. During the endemic times, there was usually a chaos when the isolated facilities were not enough and the WHO criteria couldn't discriminate definitely the victims of SARS from the non-SARS febrile cases. We ever demonstrated that the WHO criteria for probable cases had only 44% of specificity for those who met with the WHO criteria for suspected cases.⁷ It means there ought to be at least 2.3-fold reservation of isolated facilities and medical costs if all probable cases were admitted to hospitals. Since then, biological events, either natural or man-made, have been focused on in the field of disaster medicine.

After a severe attack by SARS, Taiwan has been engaged in taking every effort to prevent similar events. The implement of SARS response planning and standard operation procedure seems to be the main task at present. However, it deserves to be investigated that if the planning is designed for only SARS or can be generally applied to any biological event.

Taipei City government has begun to request the emergency response hospitals to revise their disaster response planning since 2002. As our past survey revealed, the implementation of HEICS into emergency response hospitals may be the first goal.^{8,9} When SARS made an endemic episode globally this year, most of the response hospitals adjusted their response plans and have actually used HEICS in disaster response. We'd like to further understand whether the response planning has also adjusted to coronaviruser the response plans for SARS or other biological events. We thus evaluated

the disaster response plans from emergency response hospitals in Taipei to elucidate the impact of SARS on the planning.

Methods

Study hospitals

There were 52 emergency response hospitals accounting for 19,960 beds in Taipei City in 2004. Of these hospitals, eight were the tertiary care medical centers and the remaining 44 secondary referral hospitals. We then evaluated the SARS response plans from these hospitals retrospectively.

First, we checked if there is a comparable plan for response to SARS. Second, we reviewed the plans according to the modified ASTHO checklist. The checklist was composed with 25 items which has been highly selected from the original ASTHO checklist and also re-written (Table). We recorded the number of the items that were fulfilled by the plans under review.

After the above reviewing process, we checked if there is a general plan for different types of emerging infectious diseases or for bioterrorism. If such a plan was present, the detailed review would be undergone according to the 25-item checklist. The number of the items fulfilled was also recorded.

Statistic analysis

All the data were processed and analyzed with Microsoft Excel 2000 for Windows. The techniques applied to data analysis included descriptive statistics generating and independent samples by *t*-test and chi-square test.

Results

Analysis of SARS response plans

All the 52 (100%) emergency response hospitals had response plans for SARS, whereas there were merely 2 (4%) that had general response plan that coronavirus used all biological events including bioterrorism ($P < 0.001$).

As mentioned above, we reviewed firstly the SARS-specific plans according to the modified checklist. The overall average of these plans is 15 ± 8 points. The highest available targets include (1) item 1: The organization (hospital) has a draft or formally adopted epidemic SARS plan; (2) item 3: the organization (hospital) has an executive SARS epidemic planning committee that oversees the planning process, in cooperation with local health agencies.; and (3) item 9: the hospital has a command system in place (e.g., the Incident Command System) to govern roles and responsibilities during a multi-agency, multi-jurisdictional event. All the three items can be achieved in all of the SARS plans (52/52). The least achieved targets include: (1) item 2: the epidemic SARS plan is part of a general management plan of biological events including bioterrorism (2/52); (2) item 10: the plan contains the details of contact with the controlling authority over intraorganization and interorganization modes of transportation, should these need to be curtailed during an epidemic (2/52); (3) item 17: the plan has identified ways to augment public health laboratory, epidemiology and disease control staffing to meet emergency needs and in the event public health workers are affected by an epidemic (2/52); (4) item 18: the plan has a process to recruit and train medical volunteers for provision of care and vaccine administration during a public health emergency (2/52); (5) item 7: the epidemic plan addresses Worker's Compensation and Unemployment Compensation issues re-

lated to health care and other workers missing work because of isolation or quarantine (0/52); and (6) item 8: the authority has identified deficiencies in laws and procedures on quarantine, isolation and related capacities and initiated steps to have those deficiencies corrected (0/52).

The only two general plans for all biological events have gained 22 and 21 points, respectively. The targets that were neglected by both plans were the epidemic plan addresses Worker's Compensation and Unemployment Compensation issues related to health care and other workers missing work because of isolation or quarantine (item 7) and that the authority has identified deficiencies in laws and procedures on quarantine, isolation and related capacities and initiated steps to have those deficiencies corrected (item 8).

Comparisons among different rankings of hospitals

We compared the performances of 8 tertiary-care medical centers with another 44 secondary hospitals. The average score was significantly higher in tertiary centers than in other hospitals (20 ± 4 vs. 12 ± 9 , $P < 0.01$).

Discussion

This study demonstrated that most of emergency response hospitals do not take into consideration the financial and legislative problems in their SARS response plans although all of them do have such plans. The possible reason may be the committee responsible for planning does not include the financial and legislative authorities. This observation may imply that most of the disaster response plans in Taiwan still emphasize crisis management instead of

consequence management.

After SARS, most of the hospital staffs believe the previous idea that disasters are neither merely large-scale emergencies, and nor is the disaster response an expansion of the routine emergency response, supplemented by the mobilization of extra personnel, supplemented by the mobilization of extra personnel, supplies, accommodations, and equipment.¹⁰⁻¹² Most of the past studies demonstrated that the disasters had unique problems that require different strategies, both quantitatively and qualitatively.¹³⁻¹⁵ The disaster response involves variable destruction of communication system, working with different people, solving different problems, and using different resources than those for routine emergencies,¹³⁻¹⁵ so it has to be flexible in total operation but constant in role playing. As we mentioned before, the low frequency of devastating disasters always poses a problem for hospital planners, because few planners have had enough disaster experience. There is still no nationally institutionalized process for data collecting, analyzing, and generalizing the education based upon past experiences. Global warning or alerting system may be a good start.

Because of the impact of SARS, many hospitals have been confronted with the problem of possible total isolation. The response plans of isolation, evacuation, relocation, and reception were thereof seriously considered by these hospitals during the period. Other tasks such as resource sharing, widespread search and rescue, triage, patient transport that efficiently utilizes area hospital assets, dealing with the press, and overall coordination of the response have already mentioned in previous guidelines of HEICS.^{7,8}

According to public health guidance for

community-level preparedness and response for SARS provided by the Centers for Disease Control and Prevention (CDC), the plan includes core document and 9 supplements. The 9 supplements include command and control, surveillance, preparedness and response in health facilities, community containment measures, managing international travel-related transmission risk, laboratory guidance, communication and education, plans for investigation and research (in development) and infection control. A complete powerpoint slide set is also available for generalization of education. Although we did not explore if the response plans surveyed in this study met with the recommendations provide by CDC, most of the response hospitals did not have idea about the update guidance mentioned above. The phenomenon suggests that there should be professional committee that regularly updated their response planning. For example, the current version of Supplement C emphasizes that SARS preparedness and response planning in healthcare facilities should not occur in a vacuum but rather should build on existing preparedness activities and relationships with the public health community. Although healthcare facilities will likely play a key role in the follow-up of exposed patients and healthcare workers, it will be important to coordinate these activities with the local health department, especially for patients being discharged and for healthcare workers who live in the community. It recommends that healthcare facilities work with health departments to coordinate this follow-up. Because activity restrictions for healthcare workers who have been exposed to SARS-Coronavirus might depend on the level of SARS-Coronavirus transmission in the

community, it now recommends coordinating decisions on these restrictions with the health department, in accordance with the guidance in Supplement D.¹⁶

Accordingly, the recommendations for surveillance in healthcare settings have been revised for consistency with the recommendations in Supplement B.¹⁶ The guidance clarifies that, in patients who have epidemiologic links to SARS-Coronavirus, the presence of either fever or lower respiratory symptoms should prompt further evaluation. In addition, in accordance with the new SARS case definition, when persons have a high risk of exposure to SARS-Coronavirus (e.g., persons previously identified through contact tracing or self-identified as close contacts of a laboratory-confirmed case of SARS-Coronavirus disease; persons who are epidemiologically linked to a laboratory-confirmed case of SARS-Coronavirus disease), the clinical criteria should be expanded to include, in addition to fever or lower respiratory symptoms, the presence of two or more other early symptoms of SARS-Coronavirus disease. The term “universal respiratory etiquette” has been changed to “respiratory hygiene/cough etiquette.” Because patients with respiratory infections may not present with fever, the document clarifies that the recommended practices apply to all patients with symptoms of a respiratory infection. The section on staffing emphasizes that healthcare workers will need logistical and emotional support to help them cope with the challenges of responding to a SARS outbreak. Unfortunately, most of the response plans investigated in this study did not take these new points into considerations.

We believe that facilities should consider developing a formal SARS preparedness and

response plan, as CDC suggests.¹⁶ The plan may simply be an addition to existing bioterrorism or emergency response plan. A multi-disciplinary planning committee should be implemented to include different authorities such as medical, nursing, laboratory and support staff, administrative, and infection control. Other groups may need to be adjunct members to consider certain issues such as labor union, mental health, and training/education. The plan should also contain surveillance, clinical evaluation, infection control measures, patient isolation, engineering controls, exposure evaluation, staffing needs and personnel policies, access controls, supplies and equipment, and communication.¹⁶

Table. The SARS plan checklist modified from ASTHO checklist (yes=1 point; no=0 point)

1. The organization (hospital) has a draft or formally adopted epidemic SARS plan.
2. The epidemic SARS plan is part of a general management plan of biological events including bioterrorism.
3. The organization (hospital) has an executive SARS epidemic planning committee that oversees the planning process, in cooperation with local health agencies.
4. There are professionals responsible for development and implementation of specific components of the SARS epidemic plan, including enforcement of isolation, quarantine, and closure and decontamination of premises.
5. The employees of the organization (hospital) know well whether and how the hospitals use temporary facilities for provision of medical care in the event of a public health emergency or SARS.

6. The organization has identified the authority responsible for declaration of a public health emergency and for officially activating our plan during a SARS epidemic.
7. The epidemic plan addresses Worker's Compensation and Unemployment Compensation issues related to health care and other workers missing work because of isolation or quarantine.
8. The authority has identified deficiencies in laws and procedures on quarantine, isolation and related capacities and initiated steps to have those deficiencies corrected.
9. The hospital has a command system in place (e.g., the Incident Command System) to govern roles and responsibilities during a multi-agency, multi-jurisdictional event.
10. The plan contains the details of contact with the controlling authority over intraorganization and interorganization modes of transportation, should these need to be curtailed during an epidemic.
11. The plan has the details of interaction with health authorities of adjoining counties or organizations and with national agencies to ensure effective communication during a public health emergency.
12. The plan has identified an overall authority in charge of coordinating different medical personnel groups during an epidemic.
13. The plan has the procedures to access current recommendations on treatment of cases and prevention of transmission in the hospital, long-term care and home care settings.
14. The emergency response planning has involved health care product and service providers to determine how to best prevent and control disease spread and manage the health care of the population during an epidemic.
15. The plan contains the required protocol for securing needed emergency healthcare services and supplies during a public health emergency.
16. The plan has identified ways to augment medical, nursing, and other health care staffing to maintain appropriate standards of care during an epidemic.
17. The plan has identified ways to augment public health laboratory, epidemiology and disease control staffing to meet emergency needs and in the event public health workers are affected by an epidemic.
18. The plan has a process to recruit and train medical volunteers for provision of care and vaccine administration during a public health emergency.
19. The plan has identified alternate facilities where overflow cases from hospitals and well persons needing quarantine away from home can be cared for and has developed processes with Emergency Medical Services to assess, communicate, and direct patients to available beds.
20. The plan has identified facilities for outpatient and inpatient care of children with SARS and their families.
21. The epidemic plan addresses the mechanics of how isolation and quarantine will be carried out, such as providing support services for people who are isolated or quarantined to their homes or temporary infirmary facilities and protection for workers providing these services.
22. The plan ensures that appropriate personal protective equipment, including N-95 or

higher level respirators, is made available for persons whose job requires exposure to people with SARS and that needed training and fit-testing are provided.

23. The plan deals with mass mortality, including transportation and burial of bodies.
24. The plan provides mental health services to mitigate the impact of a SARS epidemic.
25. The plan has conveyed the importance of epidemic preparedness, and its overlap with bioterrorism preparedness, to my jurisdiction's chief executive and to other organization and local law and policy makers.

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