Spontaneous Implementation of Hospital Emergency Incident Command System (HEICS) during SARS Epidemics

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Abstract

Although Taipei City government has requested the emergency response hospitals to implement Hospital Emergency Incident Command System (HEICS) since 2002, the initial evaluation revealed inadequate results last year. After SARS endemics, we re-evaluated the response plans provided by these hospitals to evaluate if the HEICS has been implemented. Of the 53 plans, there were about 51 (96%) that had predictable chain of management, and the average score was 79 points. As to accountability of position function, there were more plans meeting with the criteria than last year (58% v 19%, $P<0.01$), as the average score was (68 ± 5 v 45 ± 10, $P<0.01$). There were also more hospitals (n=31; 58% v 13%, $P<0.01$) containing flexible organizational chart that allowed flexible response, improved documentation of facility and common language to facilitate outside assistance. The individual scores were also significantly higher than last year. Twenty-four hospitals fulfilled the requirements of prioritized response checklists, cost effective emergency planning within health care corporations, and complete governmental requirements. The scores were thus 64, 66 and 64 respectively. The average score was significantly higher in tertiary center than in other hospitals (88 ± 9 vs. 56 ± 12, $P<0.001$). In summary, there is a trend that the hospitals implemented HEICS into their response plans spontaneously after SARS endemics. It may imply that HEICS can be a good model for disaster response. *(Ann Disaster Med. 2003;2:14-19)*

Key words: HEICS; SARS; Disaster; Hospitals

Introduction

It was well known in recent years that the Hospital Emergency Incident Command System (HEICS) has been developed to assist the operation of a medical facility in a time of crisis.[1] The main structure of the system is a chain of command that incorporates four sections under the overall leadership of an emergency incident commander.[1] The four sections including planning, finance, logistics, and operations, have their specific leader assigned by the incident commander. The leaders in turn designate directors and unit leaders of each department, with each levels of specific staffs filling other crucial roles. This structure limits the span of control of each manager in order to distribute

the work and also provides for a system of documenting and reporting all emergency response activities. It is also proven to lessen liability and promote the recovery of financial expenditures.

To our knowledge, HEICS does not take any specific type of disaster as the essentials of the operation. In other words, it can be applied to any kind of mass casualty under the concept of "general management model". It is then logical to consider the bioterrorism or an endemic event as the scope of HEICS.

Taipei City government has begun to request the emergency response hospitals to implement HEICS in their disaster response planning since 2002. However, our past survey revealed that there are still many engagements in training, understanding of HEICS and the overwhelming idea of changing out an entire disaster plan in our systems.[2] Despite the efforts to educate the emergency response hospitals, our initial evaluation still disclosed that most of the hospitals did not understand completely the operation of HEICS. However, when SARS made an endemic episode globally this year, Taiwan became one of the prevalent areas. Most of the response hospitals adjusted their response plans. It deserved us to re-evaluate their plans. We therein retrospectively collected the SARS response plans from these hospitals and examined if they were comparable with HEICS.

Methods
Study hospitals

There were 53 emergency response hospitals accounting for 20,160 beds in Taipei City in 2003. Of these hospitals, seven were the tertiary care medical centers and the remaining 46

secondary referral hospitals. We then evaluated the SARS response plans from these hospitals retrospectively. We reviewed all the plans under the guidelines of HEICS that concentrated upon: predictable chain of management; accountability of position function; flexible organizational chart; documentation of facility; communication to facilitate outside assistance; prioritized response checklists; cost-effective emergency planning within health care institutes; governmental requirements as was the case with public hospitals. For these 8 categories, there were about 5 to 7 items to evaluate the adequacies of the plans. Four individual experts evaluated the plans to determine the scoring. The final scores were summed up and averaged 4 individual scores. The scoring was then compared according to the different levels (or rankings) of these hospitals.

The final results of evaluation were compared with the performance last year.[2]

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
Performances of SARS Response Plans Judged by HEICS

Of the 53 plans, there were about 51 (96%) that had predictable chain of management, and the average score was 79 points (P=NS v 78 points last year). As to accountability of position function, there were more plans that met with the criteria (n=31; 58% v 19%, $P<0.01$), as the average score was (68 ± 5 v 45 ± 10, $P<0$.

01). There were also more hospitals (n=31; 58% v 13%, *P*<0.01) that had flexible organizational chart that allows flexible response to specific emergencies (average scores 68±13 v 40±3, *P*<0.01), improved documentation of facility (64±10 v 40±6, *P*<0.01) and also common language to facilitate outside assistance (60±6 v 48±8, *P*<0.05). Twenty-four hospitals (45.3%) have provided prioritized response checklists, cost effective emergency planning within health care corporations, and complete governmental requirements (*P*<0.001 v 11.3% last year). The scores were thus 64, 66 and 64 respectively.

Comparisons among Different Rankings of Hospitals

We compared the performances of 7 tertiary-care medical centers with another 46 secondary hospitals. The average score was significantly higher in tertiary centers than in other hospitals (88±9 vs. 56±12, *P*<0.001).

Discussion

There has been a trend that a hospital's emergency preparedness plan is undergone under the guidance of HEICS.[1] The HEICS plan for hospitals offers the benefits[1,3] such as predictable chain of management; accountability of position function; flexible organizational chart allowing flexible response to specific emergencies; improved documentation of facility; common language to facilitate outside assistance; prioritized response checklists; cost effective emergency planning within health care corporations, and governmental requirements in public hospitals. Under the structure of the ICS, emergency response plans share many organizational characteristics with other ICS based plans. The common language shared between plans is a great benefit and can bind hospitals and non-hospitals together in times of crisis.

Our past survey revealed that most of the hospitals in Taipei still did not make full use of the HEICS.[2] The possible reasons for the hesitancy for a conversion may include time, cost and lack of internal desire. Sometimes the real reason is lack of understanding of HEICS and the overwhelming idea of changing out an entire disaster plan. All of these concerns are valid. However, all facilities need to examine the real attributes and benefits of an Incident Command System-based plan. There are distinctive advantages to the entire disaster medical response community when all participants operate in a similar, predictable fashion.

There has been a major global outbreak of SARS.[4-8] Although the confirmatory tests such as polymerase chain reaction and measurements of coronavirus antibody have been undergone in many laboratories,[9] they still cannot provide instant and correct information for clinicians at the first moment. The WHO criteria may help screen the suspected and probable cases,[8] but the low specificity may indicate the lacking of cost-effectiveness in an endemic area. Most of the emergency response hospitals agreed that SARS is a kind of disaster and re-considered the response plan for such a disaster.

After SARS, most of the hospital staffs believe 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.[9-11] Most of the past studies demonstrated that the disasters had unique problems that require different strategies, both quantitatively and qualitatively.[12-14] 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,[3,12-14] 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 there 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 responsehave already mentioned in previous guidelines of HEICS.[1,2] Most of the hospital administrators also agreed that HEICS could afford not only what were expected but also what were unexpected because of its underlying "general management principle".[11] In contrast, a traditional written plan can be an illusion of preparedness if other requirements are neglected.[3,6,9] It was so-called "paper plan syndrome". Reasonable and valid assumptions about the trends and prevalence of the disasters, inter-organizational perspective,[2,15] and the provision of resources[12] become the essence of the plans. Repeated training and drills can make each staff familiar with the system,[16] and operate accordingly from his heart. All of the staffs have to be engaged in the modification and operation in every stage of the disasters in the practical, realistic, and legitimate way.[17,18]

In conclusion, although SARS brought us a devastating disaster, it still made the hospitals implemented the HEICS spontaneously into their disaster response plans. The good beginning should be considered a significant advance in disaster preparedness.

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