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How were the High-Fever Consultation Center Perceived by the Officers Who Provided it in Kobe City, During Swine-Origin Influenza A (H1N1) Outbreak? A Qualitative Study Utilizing SCQRM

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ABSTRACT

Background: For the preparation of pandemic influenza, Japan's government requested to set up a high-fever consultation center at each prefectural and city government. During the initial period of pandemic influenza A (H1N1) outbreak in Japan, high-fever consultation centers received a great number of calls. The effectiveness of this system, however, has not been fully evaluated. This study reports the result of a qualitative study, which explored officers who provided the high-fever consultation center during influenza outbreak.

Methods: A qualitative study, using semi-structured interviews (n=3), was conducted to the officers of a major city government in Japan, who provided the service. Theory construction was conducted with a use of structure construction qualitative research method.

Results: The officers expressed many difficulties during the outbreak. The uncertainty of the disease characteristics, rapidly changing situation, fear of bad outcome of patients due to wrong triage, and miscommunications among health care workers were among the difficulties extracted. While inefficiency was among the problems extracted, lessening anxiety of callers was one of the achievements they felt the high-fever consultation center provided. Development of practical manual made their provision of the service easier.

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Conclusion: Various aspects of the high-fever consultation center during swine origin influenza A outbreak were extracted through the interview. Perception of the officers may aid at understanding the effectiveness and shortcomings of high-fever consultation centers, which may lead to its further improvement.

The world experienced the first ever pandemic of influenza (2009 influenza A (H1N1)) in the 21st century. Japan experienced the first imported case on May 9th 2009, and the first case without travel history to endemic area was reported in Kobe, Japan on May 16th [1]. The disease spread rapidly and in July 2009, all prefectures in Japan identified patients with 2009 influenza A (H1N1) [2].

Upon the emergence of pandemic, Japan's government requested to set up a high-fever consultation center (HFCC) at each prefectural and city government. Also, Japan's government requested each prefectural and city government to set up a high-fever outpatient department [3]. It tried to distinguish between people with influenza and those without, and febrile patients were discouraged from visiting regular medical facilities and instead instructed to go to the high-fever outpatient departments (HFOD), set up at designated medical institutions. Furthermore, Japan's government required people to call HFCC before going to medical facilities to make sure only potential influenza patients visited HFODs [3].

During the initial period of influenza outbreak in Japan, HFCC in Kobe city received a great number of calls. Before the first case was identified in Japan, HFCC opened from 9 AM to 9 PM only with 3 telephone lines, and the additional night shift call was taken at home using a cellular phone. All calls were taken by public health nurses then. After the first case of pandemic influenza in Japan, the calls increased dramatically. During the daytime, about 70 to 90 calls a day (20 to 30 calls/person/day) were made. HFCC received the maximum of 2678 calls a day in May 19th. Afterwards, the number of patients decreased gradually. More than 100 officers took part in the activity of HFCC to various extents (Data provided by Department of Health and Welfare, Kobe City Government). However, the effectiveness of this system had not been fully evaluated.

This study reports the result of a qualitative study, which explored officers who took calls at HFCC in Kobe city during influenza outbreak in May and June 2009.

METHODS

Design:

The purpose of this study is to examine the perception about HFCC by the officers, who provided it and to generate a hypothesis regarding it. This study adopted the methodology of qualitative research, not of quantitative research. This study tried to restructure the experience of the participants by coding their comments and gathering them by the investigators, so that the hypothesis shall be generated. For this qualitative study, we employed SCQRM, or Structure Construction Qualitative Research Method to be able to make small samples size applicable to the current study (*vide infra*).

SCQRM was developed by Saijo [4, 5] , and it determines the number of cases or samples based on the research questions (or interest) of researchers, therefore preserving scientific validity and falsifiability in a few case study by structuring the model of target and showing construction trail.

Semi-structured interviews were undertaken in September 2009. Each interview took about 30 minutes. Participants were asked questions such as how was it to work at HFCC, what were difficulties in working as consultant, or the achievement the service provided, and so on.

All interviews were transcribed verbatim. Transcripts were initially free-coded by K.I. using OmniOutliner 3.9.5 (The Omni Group, Seattle, WA, USA) according to content, and then organized into thematic units [6] with a use of M-GTA (modified-grounded theory approach) [7].

Hypotheses were generated and summarized into a conceptual diagram, using OmniGraffle Pro 5.2 (The Omni Group, Seattle, WA, USA). In addition, generated thematic units and conceptual diagram were reviewed by T. S., a qualitative research expert, for the content.

Participants:

In Quantitative research using random sampling of many participants, the number of participants should be as many to meet the needs to avoid statistical error. However, SCQRM aims at generating hypothesis with small sample numbers. In the current study, 3 persons were selected as the number of participants.

Three officers of Kobe city government in Japan were recruited as interviewees. A manager of the city government department of health and welfare randomly recruited participants. Kobe city consists of about 1.5 million people and is located in west part of Japan. All participants approached by the manager were made aware that participation was voluntary. Signed informed consent was gained from all participants prior to participation by the researchers.

Of 3 participants, 1 was male, 2 were female. The first participant was aged 21–30, the second participant was aged 31–50, and the last participant was aged 51 and over. All the participants were Japanese. One was public health nurse, and the other was ex-nurse who used to work at a hospital but later turned to public health nurse. The last officer was engaged in public administration but never had health related work experience, and was asked to work for HFCC during the outbreak due to the shortage of human resources.

RESULTS

All thematic units were summarized into a conceptual diagram (Figure). Followings are the details on each unit.

Difficulty during the initial period:

On the first day of the outbreak in the city, there was no manual or instruction how to deal with febrile patients without travel history, since the national government's diagnostic criteria did not include patients without travel history nor contact with influenza patients. The city government tried to contact the national government for advice but was not able to communicate due to turmoil. The city government then developed its own provisional local rules. Only in cases with high fever with direct contact with probable patients, people were instructed to go to HFODs. Otherwise, people were instructed to stay home. To develop modified diagnostic criteria, doctors at HFODs were consulted for their opinion. A non-medical officer disclosed that if callers did not have typical symptoms of influenza such as sore throat or myalgia, HFCC usually judged that a person did not have influenza and instructed to stay home.

Call characteristics:

On the first day of the outbreak, most patients had only mild symptoms such as sore throat, according to the participants. However, people started to complain relatively more severe (as per a participant) symptoms such as high fever.

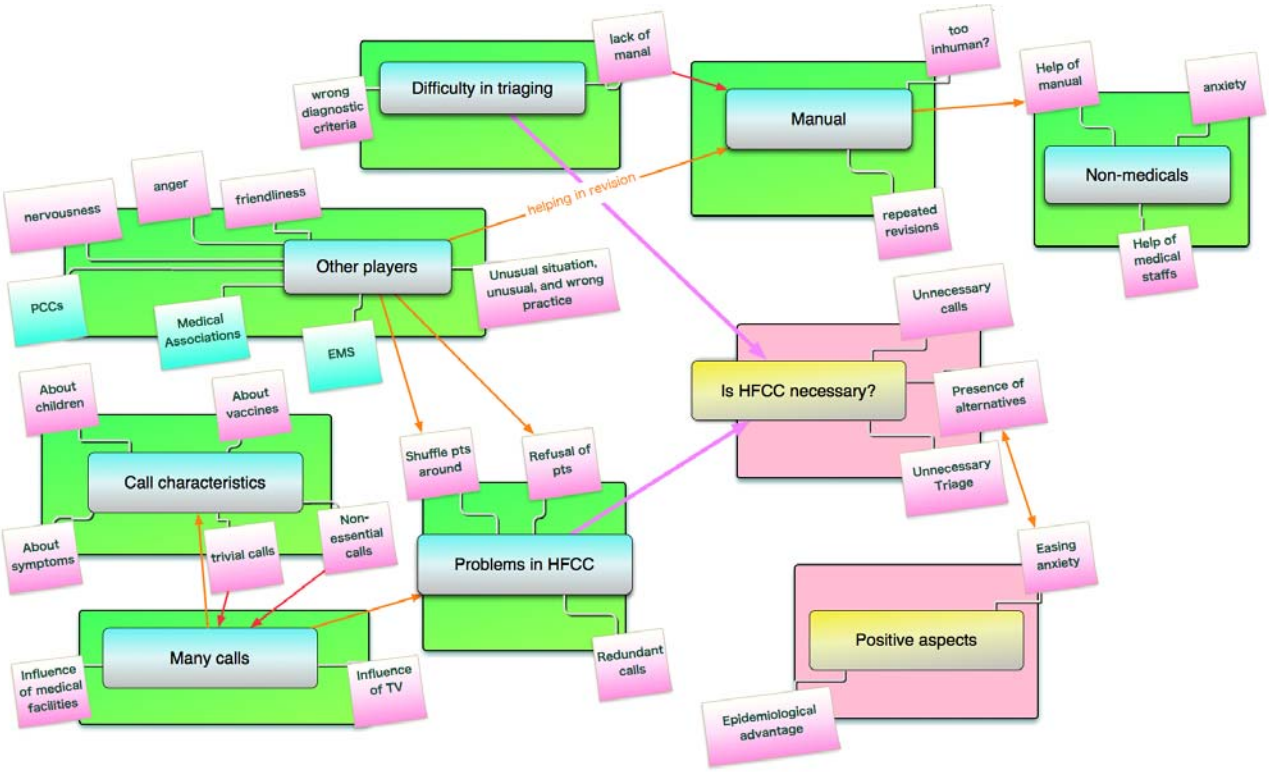

Figure. Conceptual Diagram on HFCC by the participants.
HFCC, high-fever consultation center. Pts, patients. EMS, emergency medical service. PCCs, primary care physicians.

Many calls were about febrile children. According to the participants, triaging children were not that stressful. For triaging, they focused on activity and fluid intake of children. Even though they were relatively comfortable taking calls about children, they admitted that they did not have experience in pediatric care.

In some cases, calls were not about their own symptoms. For example, some calls requested to name the school of outbreak from curiosity.

In August and September when the cases decreased, the inquiries shifted towards about vaccination program.

Sometimes, callers showed frustration with HFCC. One time, a HFCC officer advised a patient in his 30s to go to a HFOD but the caller insisted on calling an ambulance. At that time, he yelled at the participant with irritation.

Perceptions on number of calls:

As the first day of the outbreak was Saturday (May 16th), most outpatient clinics and hospitals were closed. On the third day (Monday, May 18th) of the outbreak, many clinics opened their outpatient clinic but some clinics refused to see patients with fever and asked patients to call HFCC. A participant felt this made their work very difficult. In addition, TV advertisements on Monday encouraged people with symptoms to call HFCC before going to medical facilities, which may have increased the number of calls, according to a participant.

The first 7 days after the outbreak was filled with many calls, which started early in the morning and lasted until 1 AM in the morning, according to the participants. One call

consisted of about 4 minutes, but it could take for 20 to 30 minutes, especially when the call included complaints. In usual cases, a person had to take about 10 calls an hour. A call came instantly after hanging up, and one participant told us that they were not even able to drink water during the duty. For the callers, it was difficult for phone to connect. Especially in the initial phase of the outbreak, it could take about 30 minutes before HFCC took a call. Callers tended to be frustrated, as they had had to wait so long. A participant found it difficult to communicate with people who were already irritated.

Each officer working at HFCC had shifted to take calls. In general, a person took one shift work a week.

After a week of turmoil, number of calls gradually decreased, so was the number of influenza cases. While people at HFCC were so busy taking calls for about a week after the outbreak, a non-medical officer who started to help them afterwards felt that he was not that busy. He worked at HFCC about once a week, and later his shift even decreased to once in 2 weeks.

Perceptions on the manual:

Because there was no working manual initially, a provisional manual was drafted. The participants commented that the manual became 'usable' about one week after the outbreak following many revisions. The manual was first drafted by a physician at Department of Prevention and Hygiene of the city, in accordance with the recommendation by the national government. Afterwards, the manual was revised with advice by a local medical association and others. The original manual only included patients with travel history to Mexico, Canada, and the United States, or patients who had direct contact with influenza patients, since the national government assumed there was no such thing as "domestic" outbreak, which turned to be false later. After identifying the case without apparent travel history, the city government had to amend the manual to triage patients appropriately.

A participant felt the manual was useless as it had too many information without being well organized. Even if the person wanted to ask questions regarding uncertainty in the manual, everybody was so busy at that time and the person was unable to ask questions to anybody. After revisions, the manual became shorter and shorter to make it user friendly and became 3 pages long 2 to 3 weeks after the outbreak. An algorithm was produced and questions became standardized.

According to a participant, potential downside of the manual was about making response very bureaucratic. Also skipping questions when one meets criteria to go to HFODs was another potential problem the participant admitted. For example, if a person had high fever, one was instructed to go to HFODs and hung up the phone without asking any further question. The caller might have taken it as too inhuman.

Role of non-medical officers:

Because of shortage of human resources, non-medical officers also participated in the high-fever consultation center later during the outbreak. For non-medical personnel, public health nurses were always available for support. If a person was to be advised to go to HFODs, the public health nurses always discussed the case with the non-medical officer who took telephone. Since the initial outbreak was isolated cases within limited number of high schools, calls from students of these schools also was discussed with the public health nurses. In addition, for patients with apparent exposure to influenza patients, public health nurses took over the phone.

Initially non-medical officer felt very difficult in taking calls. One time, the participant asked only about fever and was about to finish the call when the temperature was below 38℃. The caller might feel uneasy since the service did not ask anything other than the temperature.

Medical officers such as public heath nurses perceived that non-medical officers appeared very nervous at the beginning. They started to work without proper manual. The manual was drafted and shortened to the level these non-medical officers felt comfortable using it. With help of the manual and the practice of 10 or so calls, the non-medical officer felt comfortable and confident in taking calls. All he had to do is to follow the flowchart and hang up the phone after telling people "Take care", as per the manual.

However, a public health nurse showed a concern that the response of non-medical officers tended to be too "bureaucratic". It was felt that they sometimes simply followed the manual without focusing on individuality of each case.

The non-medical participant felt uneasy in making advise for children such like ones about fluid intake. On the other hand, one public health nurse noticed that one non-medical officer learned to say, " Take a lot of fluid". This person started to advise the same to many people regardless of context. To the public health nurse, it was not ideal to learn things through the experience only without paying attention to the context of the situation.

Perceptions on other players:

A participant thought doctors then reacted too nervously and hoped they calmed down. Local medical association showed anger when some patients visited clinics with fever, and they felt these patients should have gone to HFODs instead. On the other hand, most primary care doctors were willing to see febrile patients, especially when they knew the patients well for long time.

The participants acknowledged that emergency medical service, or EMS and HFCC did not function well to the extent what they should have. One participant felt that during the outbreak of influenza, EMS tended to focus only on fever and forgot to mention categories they did not usually forget, such as measurement of blood pressure or whether patients are vomiting or not.

Refusal of patients. Redundant calls. Shuffling one around:

One time, EMS called the service about a patient with diabetes. This person was febrile with altered mental status. The service called one's primary care physician but the doctor refused to take the patient due to fever. The service called an emergency room of a hospital but it also refused to take the patient. The service then called the HFOD and it again refused to take the patient as it felt it is not an influenza case. After lengthy negotiation, one of HFODs took the patient outside the region patient lived.

At other time, HFCC asked a caller to call EMS on a case as it felt that was medical emergency, but the EMS refused to take the patient since the patient was febrile and they felt it was wrong to take patients with possible pandemic influenza. After this episode, the manual was revised so that EMS could accept these patients. EMS agreed with the way HFCC recommended.

Another episode, a participant recalled, was about HFCC calling emergency room and EMS back and force while EMS taking care of a patient with shock. During the episode, the patient started to lose his consciousness.

Also, an elderly person had an aspiration with lowering blood pressure and the staff called HFCC for advice. HFCC officer advised them to call an ambulance. EMS then

advised them to call back HFCC. With the emergency situation, the phone hung up suddenly and the participant lost track of the patient.

The participant felt it was rather a waste of time to spend time to call and communicate with HFCC while taking care of sick patients.

HFCC had to discuss the issues with many bodies to reach agreement on how to run the service. They had to negotiate with the local medical association, HFODs, doctors in the city, and public health bodies. For example, the criteria on which patients to be recommended to go to HFODs were discussed in detail with the clinics and local doctors. HFODs complained sometimes since too many patients surged into the clinics. However, local doctors also expressed the concern that if the criteria were so strict and select only small number of febrile patients, patients might decide to go to other medical facilities not designated as HFOD.

Was HFCC really necessary?:

A participant felt most calls were about children with fever who probably should have gone to hospitals without calling HFCC. The rule to call HFCC without exception was very inconvenient for citizens. Most calls during late at night were about acute onset fever and the question whether to go to the hospital. A participant thought use of HFCC for that purpose during that time was inefficient.

Sometimes, one of the participants felt that HFCC was not functioning well. Many calls were about relatively trivial matters, such as about concern of low-grade fever, or the complaints about doctors who refused to see patients.

One participant pointed out that there was no point discussing whether a patient had influenza or common cold. This kind of triaging appeared useless, according to the participant.

On easing anxiety, after receiving many calls, one participant said she recognized that conventional health related leaflets could have included information to ease anxiety, so that unnecessary calls to HFCC would have decreased. General information such as advice for immunocompromised persons, or Questions & Answers for general concerns could be done at regular health information center, not HFCC. Also commented was that posters and other tools could be used instead of HFCC.

There was also a comment about the ability of HFCC to triage the patients accurately. The participants felt that distinguishing patients with influenza and those without are difficult.

The positive aspects of HFCC:

The participants felt the best achievement the service provided was to ease the anxiety. Both callers and HFCC staffs were anxious because they lacked proper information. This anxiety might have come from excitement during the outbreak. The service might aid in easing the anxiety even though the function of HFCC was not enough to the extent of the expert doctors, according to a participant.

Additionally, HFCC could understand the epidemic better. For example, if there were calls by the same high school students, they could conceive that that school was experiencing the outbreak. The service could have functioned from epidemiological point of view, not just from clinical point of view, one participant said.

DISCUSSION

Several studies analyzed 2009 pandemic influenza A (H1N1) qualitatively [8, 9]. This study is, as far as we are aware, the first study, which explored the function of HFCC qualitatively.

HFCC in Kobe city started only with public health nurses, but later added non-medical personnel due to many calls. They were forced to take many calls, particularly during the first week of the outbreak in the city. At one point, more than 2000 calls were taken in a day by HFCC, and more people called it but unable to connect to it.

The participants perceived that triaging patients over telephone had been difficult. It became easier after revising the manual repeatedly. However, even though it became "easier", it is not clear whether it became appropriate. One participant thought high fever was associated with severity of influenza, which may not necessarily be true [10]. The participants did not always feel uncomfortable in taking calls about febrile children even without proper training or experience in pediatric care. It is possible that the participants did not know the potential dangers or pitfalls in taking care of children, and inappropriately triaged them over the phone. In addition, the meaning of distinguishing between those with influenza and those without were questioned. Later in the epidemic, the city ceased to distinguish these two and started to see patients at most medical facilities equally. Many diseases with fever are not influenza, and many infectious diseases other than influenza are contagious to others. The meaning of HFCC from that point of view should be questioned.

The study revealed that HFCC had some inefficiency. There were many calls and one had to wait for up to 30 minutes before HFCC took call. Subsequently, non-medical personnel had to be introduced to HFCC. However, many calls were about irrelevant questions such like the name of the school with epidemic. Most information provided by HFCC could be done through leaflets, posters and other methods. It was fortunate that the first epidemic in the city did not last for long time. However, if an outbreak of emerging infectious diseases occurred with longer duration, durability of HFCC of this kind may not be appropriate.

HFCC also could cause confusion among EMS, medical facilities and HFODs. The rigid rule to call HFCC before going to medical facilities might have been inefficient. Care might have been hampered by the act of telephone calls, particularly when it comes to the emergency situation. There were cases when EMS, medical facilities, and HFODs refuse to see patients. This might delay the necessary treatment, and it may cause anger and anxiety in patients to be transferred.

The short, concise, and practical manual appeared useful during the outbreak. It had to be revised repeatedly to make this user-friendly. Downside of the manual, however, was also pointed out that it might have led to bureaucratic response to callers.

Positive aspects of HFCC were also pointed out. Most were regarding the easing anxiety of patients, but not about appropriate triage of patients as it aimed at.

HFCC may be still useful and may aid in helping people in the city to ease the anxiety and deliver the information needed. However, placing too much human resource with service for 24 hours a day, 7 days a week may not be efficient.

HFCC may not be useful in triaging patients. First, it may not be necessary as the participants stated. Second, it might not be precise in accurately triaging patients suggested by our result, and the third, it can rather cause confusion and delay in patient care. However, the function of HFCC may be useful for more general purpose to seek appropriate medical facilities to avoid shuffling patients around.

We are aware of limitations of the current study. First, since this is not quantitative study, aspects dealt quantitatively were not discussed. Second, since this study aimed at forming a

hypothesis, not proving it, we do not claim to generalize our results to different settings. For these, further studies with different research questions and methodology need to be conducted. Also, further studies with similar qualitative methodology at different setting, for example, abroad, may be of interest to see and compare with the current study.

CONCLUSION

Various aspects of the high-fever consultation center during swine origin influenza A outbreak were extracted through the interview. Perception of the officers may help to understand the effectiveness and shortcomings of the high-fever consultation center, which may lead to further improvement of it.

CONFLICTS OF INTEREST

None of the authors have any finantial or conflict of interests related to this study.

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