Disclosures

I have nothing to disclose

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WE SINCERELY THANK THE PEOPLE OF UNITED STATES FOR YOUR GREAT SUPPORT

2014. 5.24
High Risk Emergency Medicine
Westin Hotel Market Street
San Francisco, CA

The Japanese Tsunami – Looking Back on Lessons Learned

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Westin Hotel Market Street
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Tohoku University

Tohoku area
pop. 9 million
Sanriku
pop. 1 million
March 11th, 2011
2:46 PM

<table>
<thead>
<tr>
<th></th>
<th>TUH</th>
<th>NSMC</th>
<th>SCMC</th>
<th>OH</th>
</tr>
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<tbody>
<tr>
<td>Bed</td>
<td>1308</td>
<td>698</td>
<td>525</td>
<td>330</td>
</tr>
<tr>
<td>Building</td>
<td>17</td>
<td>6</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Emergency Center</td>
<td>High Level Emergency Center</td>
<td>Emergency Center</td>
<td>Emergency Center</td>
<td></td>
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</tbody>
</table>

Unpredictable Huge Disaster

Unpredictable Huge Disaster

Courtesy of Sendai Fire Bureau
Damages in Sendai
Highway stopped tsunami

Costal region is still under recovery process

Ishinomaki Municipal Hospital (5 Floor, closed)

Signature of the disaster and the lessons we learned

Higashi Matsushima

2013.4
Widespread loss of infrastructure

Limited number of casualties by building collapse

Elevators are lifeline

17:00 TUH (2 hours after onset)

<table>
<thead>
<tr>
<th>Event</th>
<th>Report</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:46</td>
<td>Onset</td>
<td>(M8.8)</td>
</tr>
<tr>
<td>(15:00)</td>
<td>Disaster headquarters office</td>
<td>Started recording chronology</td>
</tr>
<tr>
<td>15:30</td>
<td>CT out of service</td>
<td></td>
</tr>
<tr>
<td>15:32</td>
<td>DIS estimated 1,000 deaths</td>
<td></td>
</tr>
<tr>
<td>15:38</td>
<td>System down: Medical IT system</td>
<td></td>
</tr>
<tr>
<td>16:10</td>
<td>OR: No availability</td>
<td></td>
</tr>
<tr>
<td>16:15</td>
<td>PHS not available in the OPD</td>
<td></td>
</tr>
<tr>
<td>16:40</td>
<td>Lab works available only at the dialysis room</td>
<td></td>
</tr>
</tbody>
</table>

Pitfall
Emergency outlet

Pitfall
Air conditioning (coupling)

Pitfall
PHS: unexpected explosive overload
Power Center
2800 KW Diesel
1600 KW Ward
1200 KW others

PET Center
Emergency Center
2000 KW x 2 Gas

Actual supply 1400 kW on 3.11 !!

Peak (summer) 9390 kW
Normally 8000 kW

We did not expect loss of gas supply

PET

Center

Peak (summer) 9390 kW
Normally 8000 kW

Actual supply 1400 kW on 3.11 !!

Lessons learned
Electricity / Diagnostic instruments

CT was not available until March 12th
at Emergency Center.

- Lack of emergency electric outlet
- Lack of meticulous planning to secure electricity for running CT
Lessons learned

Telecommunication

- Telecommunication connectivity seriously affected
- Lack of sufficient alternatives and knowledge
- Twitter and social networking initially unavailable but ultimately proved to be effective despite potential for misinformation
Effort to reduce avoidable visit

- Home oxygen therapy / Dialysis
- Healthy people seeking for electricity, accommodation

Increase of pneumonia

- No significant difference by age and sex
- Prevention program: mask / vaccination / oral care

Cardiovascular / Cerebrovascular disease

- Heart failure, pulmonary thromboembolism, infectious endocarditis increased
- Cerebral infarction increased in elderly male

Signature of the disaster 4

Chronic disease management

Accidental hypothermia

- hospitalized < 72 hr due to cold-water exposure
- Many patients were successfully treated

Furukawa H, et al. in press

Signature of the disaster 5

Transfer out

Played important role for allocation

Two flight options were not enough!!

2011.3.11 PM 4:30
Sendai Airport

2011.3.11 PM 4:30
Matsushima SDF Base

Discussion

- Maintenance of hospital function under wide range collapse of infrastructure was critical issue
  - Earthquake proof, Fire proof
  - Storage of medicine and materials
  - Have substitute areas for triage and temporary accommodation
  - Must continue clinics without stoppage of supplies (ex: self generators, tents for clinic, and materials)
  - Secure helicopter pad in the neighborhood
- Maintaining condition of chronic disease patients