The Experience of Chest Pain Centres: in China, What Have We Got?

Dingcheng Xiang MD, PhD.
Director of Chest Pain Center
Guangzhou General Hospital of
Guangzhou Military Command
Guangzhou, China
Disclosure

• No conflicts of interest to be disclosed
The development of CPC in China

- 2002: 1st CPU
- 2005-2006, Green channels: 2 hospitals
- 2010: Chinese Consensus on CPC and 3 CPCs
- 2011: the 1st Summit Forum of CPC and 4 CPCs
- 2012: 6 CPCs
The models of CPC in China

- In-hospital green channel model
  - D2B or D2N

- Standardized CPC model: Rescue network of STEMI
  - D2B → FMC-to-B
  - Symptom-onset-to-B
In-hospital green channel: crucial

- D2N 83min
- D2B 132min

D2N<30min: 7% of the patients with thrombolysis

D2B<90min: 22% of primary PCI

Beijing STEMI registry study, 2008
However, pre-hospital delay is much more significant than in-hospital delay in China.
Symptom-onset-to-door was delayed in the STEMI patients in China

- Atypical symptoms, intermittent or tolerable chest pain and misjudgement were the independent predictive factors of delay for hospital admission.

Beijing STEMI registry study, 2008
The reasons of AMI patients choose hospitals

- Nearest to my home
- I think it is the best hospital
- Appointed hospital by insurance
- Nearest to the site of symptom-onset

Percentage:

- Others: 1.3%
- Near to my home: 4.2%
- I think it is the best hospital: 22.1%
- Appointed hospital by insurance: 31.1%
- Nearest to the site of symptom-onset: 56.1%
The most of AMI patients in community hospitals were not given the standard therapies in the early stage.

About 3/4 of AMI patients went to or were sent to the nearest community hospitals.

From the baseline data of our CPC.
Status of ACS in China

• CPACS: ACS registry in the cities of China
  - Delayed symptom-onset-to-door
    • 5h in grade 2 hosp
    • 8h in grade 3 hosp

Heart 2008; 94:554-560
Am Heart J 2009;157:509-516
More attention to symp-onset-to-B

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symp-onset</td>
<td>0:00</td>
</tr>
<tr>
<td>Call EMS</td>
<td>5:00</td>
</tr>
<tr>
<td>Door in commu hosp</td>
<td>5:21</td>
</tr>
<tr>
<td>Door out</td>
<td>7:17</td>
</tr>
<tr>
<td>Door in PCI hosp</td>
<td>9:06</td>
</tr>
<tr>
<td>Balloon</td>
<td>10:01</td>
</tr>
<tr>
<td>End of PCI</td>
<td>10:23</td>
</tr>
</tbody>
</table>

D2B=55’, FMC2B =280’, Symp-onset-B =601’
How to improve?

To shorten D-to-B(N)  
In-hospital green channel

To shorten FMC-to-B  
- In-hospital green channel  
- Training community hospitals  
- Rapid transfer

To shorten Symp-to-B  
- In-hospital green channel  
- Training community hospitals  
- Rapid transfer  
- Health education in communities
How to get it?

To establish a standardized CPC model:
Rescue network of CPC
The working process of rescue network of CPC

The 12-lead ECG, blood pressure, blood oxygen saturation, TnI, BNP, and D-dimer, images were real-timely transmitted to CPC through a special 3G channel.
Based on the real-time remote transmission system of life-monitoring, CPC set up a network with the regional rural/community hospitals to establish Tele-ICU. 12-lead ECG and other life signs of patients with chest pain in rural/community hospital can be transmitted to CPC. Specialists in CPC can guide of remote-site first aid treatment & diagnosis.

Tele-ICU: Your patients in ICU can be supervised by both of you and me, I conduct you to rescue.
Mobile-ICU

- Equipped Ambulance with ICU standard
  - Tele-monitoring system
    - 12-lead ECG
    - Blood-pressure
    - Blood oxygen & respiration
  - In-pocket or on-site rapid lab detectors
    - TnI, BNP, blood gas analysis and so on
  - Life-support equipments
    - Ventilator
    - Defibrillator & pacemaker
    - CPR machine & IABP
  - Remote professional supports from the CPC
Green channel of networked CPC

- 12-lead ECG transmitted to CPC prior to the arrival of EMS
- STEMI is diagnosed prior to the arrival of patient
- Preparation for PCI on Ambulance
- Pre-hospital activating cath lab
- Bypass ED/CCU to enter cath lab directly
Networked CPC can persistently improve the quality of community hosp

• This CPC model helps promote the professional skills of the physicians in community hospitals:
  – Tele-ICU helps make decisions in daily practice with intensive care patients.
# Achievements of our CPC

968 patients with acute chest pain

<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Death</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute chest pain</td>
<td>968</td>
<td>34</td>
<td>96.49%</td>
</tr>
<tr>
<td>Emer PCI</td>
<td>336</td>
<td>7</td>
<td>97.91%</td>
</tr>
<tr>
<td>Aortic Dissec</td>
<td>67</td>
<td>9</td>
<td>86.56%</td>
</tr>
</tbody>
</table>

From April 1, 2011 to Aug 16, 2011
D2B before & after the establishment of CPC

- Before CPC (2010.4.1-2011.3.31):
  - 127.42 min
- Guideline requirement:
  - 90 min
- After CPC (2011.4.1-2012.3.31):
  - 71.83 min

ESC2012
Monthly average minutes of D2B
(from April 1, 2010 to July 30, 2012)

CPC was established (2011-3-27)
Ratios of D2B less than 90min

Monthly percentage of D2B less than 90min

A total of 16 months: greater than or equal to 75%: 14, less than 75%: 2

- Our center
- International standard (75%)
Decreased medical cost

Average hospitalization time

Average medical expenses

8/28/2012

ESC2012
The 1st Summit on CPC of Guangdong Province
——March 27, 2011

The 1st National Summit on CPC of China
——Oct.22, 2011
Guangzhou General Hospital of Guangzhou Military Command
广州军区广州总医院

An SCPC Accredited Chest Pain Center
U.S. Society of Chest Pain Centers
SCPC认证的胸痛中心
美国胸痛中心协会
Next week and near future

Guangdong STEMI project

Guangdong Society of CPC
IOT of CPC network in Southern China

Civil hospitals
- Network Hospital A
- Network Hospital B
- Network Hospital C

University hospitals
- Network Hospital A
- Network Hospital B
- Network Hospital C

Guangzhou General Hospital

Schematic Diagram of Southern China IOT of CPC Network

8/28/2012  ESC2012
Conclusion: CPC in China

• At the early stage of developing

• Significant achievements in recent 2 years
  – Improved rescue of AMI by shortening D2B
  – Promoted skill of physicians in rural/community hospital

• Networked CPC model was developed under the support of advanced IT technology
Thank you for your attention!