Full Duration Management of Hepatitis C in General Hospital via IT System
---- a case from Peking University People’s Hospital

WEI Lai, Vice President , Peking University People’s Hospital
Oct 2nd, 2014
Introduction

• Introduction of PKUPH
• Hepatitis C Disease burden in China
• Monitoring of Potential population with HCV infection
• Consulting & Referral
• Infections reporting
• Follow up & collaborative studies with Dr. ASF Lok
• Future of Hepatitis C research in China
Introduction of Peking University People’s Hospital & Peking University Hepatology Institute
Peking University People’s Hospital (PKUPH)

- the first general hospital financed and operated by the Chinese nationals

Dr. WU Lien-the, the founding director of PKUPH and a candidate for the 1935 Nobel Prize in Medicine

Published by the Modern Hospital, a monthly magazine, Chicago, U.S.A., in April 1917
History of PKUPH

1918 — Peking University People’s Hospital, originally named Peking Central Hospital, was founded at Baitasi, Beijing

1946 — Peking Central Hospital was renamed Central Union Hospital

1950 — The hospital was donated to the Chinese Ministry of Health

1956 — The hospital was renamed Beijing People’s Hospital

1958 — People’s Hospital affiliated to Beijing Medical College

2000 — After Beijing Medical University reunited with Peking University, the hospital was renamed Peking University People’s Hospital

1991 — The Xizhimen campus opened

2006 — A new inpatient building was built
Peking University People’s Hospital (PKUPH)

• a comprehensive and multi-specialty hospital with three campuses located in the central part of Beijing

Xizhimen Campus
(1400 beds)

Baitasi Campus
(300 beds)

Qinghe Campus
(500 beds)
Peking University Hepatology Institute

Established in 1978

Invented the first HBV vaccine

Invented the first generation of hepatitis B virus and hepatitis C virus diagnostic agent in China

Comprehensive Institute
  Basic research
  Experimental diagnosis
  Medical care
Hepatitis C Disease burden in China
Fig. evaluation of the effect of the hepatitis B vaccine based on the HBsAg rates in the Chinese population

HCV infection among different population in China

<table>
<thead>
<tr>
<th>Population (Million)</th>
<th>Anti-HCV(%)</th>
<th>Estimated infected population (million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General population</td>
<td>0.43</td>
<td>5.6</td>
</tr>
<tr>
<td>HIV infection (0.7)</td>
<td>60-90</td>
<td>0.42 - 0.63</td>
</tr>
<tr>
<td>Dialysis (0.6)</td>
<td>20-50</td>
<td>0.12 - 0.30</td>
</tr>
<tr>
<td>MSM (5-10)</td>
<td>4</td>
<td>0.20 – 0.40</td>
</tr>
<tr>
<td>Sex Worker (6)</td>
<td>6</td>
<td>0.36</td>
</tr>
<tr>
<td>DU (1.16)</td>
<td>70-90</td>
<td>0.84 – 1.04</td>
</tr>
<tr>
<td>STD (6)</td>
<td>15-20</td>
<td>0.90-1.20</td>
</tr>
<tr>
<td>Blood Donor (10)</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>Organ Donor (0.0015)</td>
<td>5-13</td>
<td>0.19</td>
</tr>
<tr>
<td>Other High Risk (10)</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>
Increasing Incidence of HCV In Mainland China from 2005 to 2013*

* China Health Statistics Year Book
Significant Differences between Reported New Cases\textsuperscript{1} and the Corrected Estimates\textsuperscript{2}

2. Feng GS et al. ISPOR EU.. 2014
Fig. The prevalence of HBV and HCV in Chinese with different ages
More Cirrhosis among naïve Chronic Hepatitis C Virus Infection

National-wide survey in China
997 naïve patients from 28 university hospital
152 pt’s were identified complications

Predicted Cirrhosis and HCC by REVEAL/HCV Risk Model\textsuperscript{1} Based on the Corrected Estimates of New Cases of HCV from 2005 to 2013\textsuperscript{2}

![Bar chart showing predicted cirrhosis and HCC](chart.png)

Number of Cases

- **Estimated Cirrhosis**
  - In 5 Years: 102,527
  - In 10 Years: 259,196
  - In 15 Years: 421,093

- **Estimated HCC**
  - In 5 Years: 50,000
  - In 10 Years: 121,301
  - In 15 Years: 254,375

Interferon Intolerant Patients

Naïve patients (N = 438)

- Complete: 76.48% (n=335)
- Not complete: 23.52% (n=103)

103 cases not complete

- Economic
- AE
- Withdraw ICF
- Null response
- Adherence
- Death

Wei L, et al. Unpublished
Monitoring
Screening
Consulting & Referral
Infections reporting
If you were born during 1945-1965, talk to your doctor about getting tested for Hepatitis C. The only way to know if you have Hepatitis C is to get tested. Early detection can save lives.
抗-HCV in hospitalized patients

Xiangya 2nd Hospital 2004.1-10,
21605 cases, 抗-HCV: 1.68%

In August 2014, the National Health and Family Planning Commission approved a national screening and management standard for HCV infection, organized by the Peking University Hepatology Institute.
Recommendations were made to screen for HCV among persons:

Who received blood transfusions before 1992;
Who received medical or dental interventions in health-care settings where infection control practices are substandard;
Who inject drugs, had tattoos, or body piercing;
Who will have procedure
Isolated management of Hepatitis C previously

- LIS Anti-HCV
- LIS HCV RNA
- Consulting between departments
- Referral waiting and delay
- Reporting waiting
- Follow up ........

“Different System Different Patient Index”

Where am I? Where to go?
Full Duration Management of Hepatitis C

Monitoring & Screening
- LIS

Working Station
- Working station
- Mobile phone

Intervention
- Message
- PDA
The hospital infection monitoring and early warning system

Full-time staff of Hospital infection Dpt.

Informing Head of Dpt. and head nurse

On-site teaching of Infection control

Implementation of Infection control methods
Identify The Case of HCV infection & Monitoring Desk

department of patient reporting

<table>
<thead>
<tr>
<th>dept</th>
<th>name</th>
<th>reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt's name</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Message sending

Text to mobile phone

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<table>
<thead>
<tr>
<th>病案号</th>
<th>病床号</th>
<th>病区</th>
<th>住院日期</th>
<th>入院日期</th>
<th>出院日期</th>
<th>出院日期</th>
</tr>
</thead>
</table>

第1页/共9页 总计446条数据

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您好，1B病区009床患者乔某，为冠状肺炎患者，为【丙型肝炎病毒患者】，该疾病主要通过血液（或性）传播，请认真执行感染控制措施：医务人员防止锐器伤，严格做好防护措施（接触患者戴手套），医疗废物双层包装，乙肝、丙肝科会诊或就诊。【医院感染管理办公室】电话：5918/5922

发送方式：立即发送 | 定时发送 00点 00分
<table>
<thead>
<tr>
<th>序号</th>
<th>检验项目</th>
<th>结果</th>
<th>单位</th>
<th>参考区间</th>
<th>检验方法</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HBsAg-Q</td>
<td>0.02</td>
<td>IU/ml</td>
<td>0.00 - 0.05</td>
<td>化学发光法</td>
</tr>
<tr>
<td>2</td>
<td>Anti-HCV</td>
<td>14.92</td>
<td>S/C0</td>
<td>0.00 - 1.00</td>
<td>化学发光法</td>
</tr>
<tr>
<td>3</td>
<td>HIV Ag/HIV-P24</td>
<td>0.29</td>
<td>S/C0</td>
<td>0.00 - 1.00</td>
<td>化学发光法</td>
</tr>
<tr>
<td>4</td>
<td>Syphilis</td>
<td>0.11</td>
<td>S/C0</td>
<td>0.00 - 1.00</td>
<td>化学发光法</td>
</tr>
</tbody>
</table>

备注: 已复查
提示：若乙型肝炎表面抗原或丙型肝炎抗体检测结果超过检测上限（阳性），请到肝病科门诊就诊。
Notes to Hospital Infection Control Office
1. Consulting request
2. Basic information
3. Message reminding
4. Consulting confirm
5. PDA check
6. Suggestion
7. Evaluation
## Full Duration Management of Hepatitis C

<table>
<thead>
<tr>
<th>Integrated model</th>
<th>Traditional model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active monitor</td>
<td>timing</td>
</tr>
<tr>
<td>Full duration</td>
<td>manner</td>
</tr>
<tr>
<td>Simple referral</td>
<td>efficiency</td>
</tr>
<tr>
<td>All patient included</td>
<td>scope</td>
</tr>
<tr>
<td>Waiting for patients</td>
<td>Event management</td>
</tr>
<tr>
<td>Multi stage referral Manual report</td>
<td>Partial Department, partial patients</td>
</tr>
</tbody>
</table>
Follow up & collaborative studies with Dr. ASF Lok
Hepatitis C Research - Predictors of Hepatitis C Progression

Cross-sectional study
Adults with chronic HCV infection, any stage of liver disease

Two case-control study
Cirrhosis vs. no cirrhosis
HCC vs. no HCC

Prospective cohort study
Outcome: cirrhosis, HCC

Parallel studies in China and US
China: Peking University Health Science Center
US: University of Michigan Health System
Specific Aims

- To identify genetic markers that predict progression from chronic HCV infection to cirrhosis and HCC
- To identify serum markers of liver fibrosis / cirrhosis
- To validate novel serum markers for early diagnosis of HCC
- To compare the results from the cohorts recruited at UMHS and at PUHSC
  - Accuracy of genetic markers predictive of cirrhosis and HCC
  - Accuracy of serum markers in predicting liver fibrosis
  - Accuracy of serum markers in early diagnosis of HCC
Infrastructure

• Research team at each site
• Organizational structure, joint leadership, lines of reporting, communication plans, process for making decisions and for resolving conflicts
• Monthly web conference
• All documents in English and Chinese
Standardization

• Two parallel cohorts of patients studied under same protocol
• One protocol – same questionnaire
• One electronic database – same case record forms
• One manual of operation – bilingual, illustrated
• Standardized definition of outcomes
  – Verified against source documents
Key to Success in Cross-Culture Collaboration

- University-University initiate
- Serious commitment of both teams
- Mutual respect
- UMHS team bilingual and understands Chinese culture and medical practice in China
- Equal partners
- Frequent communications, monthly web conference reviews progress and problems
- Face to face meetings and mutual audits 1-2 times a year
## Peking University Hepatology Institute

<table>
<thead>
<tr>
<th></th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UM</strong></td>
<td>752</td>
<td>774</td>
<td>790</td>
<td>801</td>
<td>815</td>
<td>824</td>
</tr>
<tr>
<td><strong>P1</strong></td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
<td>28</td>
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</tr>
<tr>
<td><strong>P2</strong></td>
<td>765</td>
<td>775</td>
<td>784</td>
<td>790</td>
<td>795</td>
<td>803</td>
</tr>
<tr>
<td><strong>P3</strong></td>
<td>20</td>
<td>20</td>
<td>22</td>
<td>23</td>
<td>23</td>
<td>23</td>
</tr>
</tbody>
</table>

![Graph showing data trends](image-url)
### Characteristics of patients at UMHS and PUHSC

<table>
<thead>
<tr>
<th></th>
<th>UMHS</th>
<th>PUHSC</th>
<th>P Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total no.</strong></td>
<td>689</td>
<td>719</td>
<td></td>
</tr>
<tr>
<td><strong>Men (%)</strong></td>
<td>60.7</td>
<td>47.8</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td><strong>Age (years, median, range)</strong></td>
<td>57 (19-80)</td>
<td>53 (18-86)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td><strong>BMI (median, range)</strong></td>
<td>28.3 (14.7-55.5)</td>
<td>24.5 (14.8-49.6)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td><strong>Year of infection (median, range)</strong></td>
<td>1979 (1956-2013)</td>
<td>1990 (1958-2013)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td><strong>Diabetes (%)</strong></td>
<td>22.4</td>
<td>8.8</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td><strong>Alcohol (current/past, %)</strong></td>
<td>62.0</td>
<td>29.3</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td><strong>Smoking (current/past, %)</strong></td>
<td>78.8</td>
<td>36.1</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td><strong>Anti-HBc+ (%)</strong></td>
<td>36.2</td>
<td>43.2</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

Rao HY, et al. EASL 2014, Poster 411
## Characteristics of patients with no cirrhosis, cirrhosis, or HCC in China

<table>
<thead>
<tr>
<th>PUHSC</th>
<th>No cirrhosis</th>
<th>Cirrhosis</th>
<th>HCC</th>
<th>(P) Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total no.</strong></td>
<td>589</td>
<td>111</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td><strong>Men (%)</strong></td>
<td>49.2</td>
<td>37.8</td>
<td>63.2</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td><strong>Age (years, median)</strong></td>
<td>52</td>
<td>57</td>
<td>63</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td><strong>BMI (median)</strong></td>
<td>24.4</td>
<td>26.0</td>
<td>22.6</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td><strong>Year of infection (median)</strong></td>
<td>1990</td>
<td>1990</td>
<td>1984</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td><strong>Diabetes (%)</strong></td>
<td>5.6</td>
<td>22.5</td>
<td>26.3</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td><strong>Alcohol (%)</strong></td>
<td>29.5</td>
<td>25.2</td>
<td>47.4</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td><strong>Smoking (%)</strong></td>
<td>37.9</td>
<td>27.9</td>
<td>31.6</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td><strong>Anti-HBc+ (%)</strong></td>
<td>42.2</td>
<td>46.4</td>
<td>56.3</td>
<td>&lt; 0.01</td>
</tr>
</tbody>
</table>
Future of Hepatitis C research in China
What is difference of genetic background of patients between China and USA and impact for disease progression

How to predict disease progression?

How the treatment of Hepatitis C would reduce cancer development?
Acknowledgements

Dr. Anna S. Lok
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