Breast Cancer Epidemiology in China

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I Will Discuss…

• What are the basic facts and epi trends for breast cancer (BC)?
• What are the risk factors for BC?
• What are features of BC in China?
• What should be done for controlling BC?
I Will Discuss...

• What are the basic facts and epi trends for breast cancer (BC)?
Breast cancer

- Malignant tumor developed in the breast
- In about 10% of cases, tumors developed in both breasts
- The most common cancer in women, developed in about 1 of every 9 women in the U.S., most in their 40s and 50s
- The second leading cause of cancer death in women, after lung cancer.
Breast Cancer Worldwide

- Leading cancer in women (23% of all new cases)
- Leading cause of cancer death in women (14% of all cases)
- 1.2 million new cases and 500,000 death every year with an increasing trend.
Figure 1. Age-Standardized Rate of Breast Cancer Incidence per 100,000 Women (2000)

图 1 全球 2002 年乳腺癌地区发病率分布(Parkin2005)
Breast Cancer, New Cases, 2002

Developing: 42%
EU: 31%
North Am.: 20%
Other developed: 7%

Source: IARC
Breast Cancer Incidence, Worldwide, 1985-2010

Source: Li, XD, Ph.D Dis.
图 14 1982-1996 年间澳大利亚乳腺癌发病和死亡例数
Age standardised (European) incidence and mortality rates, female breast cancer, UK, 1975-2004

Year of diagnosis/death

Rate per 100,000 females

incidence mortality
Age-specific mortality rates, breast cancer, females, UK, 1971 - 2005

Rate Per 100,000


Uterus
Breast
Stomach
Colon & rectum
Ovary
Pancreas
Lung

图 4  美国女性主要恶性肿瘤的死亡率变化趋势 1930-2000
图 5 美国女性主要恶性肿瘤的发病率变化趋势 1930-2000
Standardized Breast Cancer Incidence in 4 cities in China, 1984-2002
I Will Discuss...

• What are the basic facts and epi trends for breast cancer (BC)?
• What are the risk factors for BC?
Genomic medicine tells us

- Diseases are the results of gene and environment interaction.
- Chronic diseases have multifactorial etiology, i.e., they are caused by many factors.
- We call these factors risk factors.
Breast Cancer Risk Factors

- Gender: F:M 1:100
- Age: Increased with age
- Weight, height, body mass index, and weight change
- Physical activity
- Reproductive factors: delayed childbirth
- Diet: fat? Vege.? Vitamin? Alcohol
- Exogenous estrogen use: oral contraceptive use, hormone replacement therapy,
- Benign breast disease
- Heredity: *Major inherited susceptibility* (BRCA1, BRCA2, P53)
- Socio-economic status: higher SES and education
- Race and immigration
Breast Cancer Risk Factors

• Gender: F:M 1:100
• Age: Increased with age
• Socio-economic status: higher SES and education
• Race and immigration
• Family history
• Gene: BRCA1, BRCA2, P53
• Reproductive factors: early menarche
Female Breast Cancer

- The chance of a woman having invasive breast cancer some time during her life is about 1 in 8.
- The chance of dying from breast cancer is about 1 in 33.
- Breast cancer death rates are going down in the U.S. This decline is probably the result of finding the cancer earlier and improved treatment.
Male Breast Cancer

- Male breast cancer is rare.
- The lifetime risk of being diagnosed with breast cancer in men is 0.11% compared with 13% in women.
- The etiology of breast cancer in men
  - genetic causes: Klinefelter syndrome, susceptibility genes BRCA1, BRCA2.
  - Nongenetic causes: radiation exposure, liver disease, gynecomastia, obesity, and exposure to estrogen medication.
Breast Cancer Risk Factors

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- Physical activity
- Reproductive factors: delayed childbirth
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- Socio-economic status: higher SES and education
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• 99% breast cancer occurred in women
• Most frequent age group: 35–55 ys
## Risk of developing breast cancer by age, females, England, 1996

<table>
<thead>
<tr>
<th>Age up to</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk up to age 25</td>
<td>1 in 15,000</td>
</tr>
<tr>
<td>Risk up to age 30</td>
<td>1 in 1,900</td>
</tr>
<tr>
<td>Risk up to age 40</td>
<td>1 in 200</td>
</tr>
<tr>
<td>Risk up to age 50</td>
<td>1 in 50</td>
</tr>
<tr>
<td>Risk up to age 60</td>
<td>1 in 23</td>
</tr>
<tr>
<td>Risk up to age 70</td>
<td>1 in 15</td>
</tr>
<tr>
<td>Risk up to age 80</td>
<td>1 in 11</td>
</tr>
<tr>
<td>Risk up to age 85</td>
<td>1 in 10</td>
</tr>
<tr>
<td>Lifetime risk (all ages)</td>
<td>1 in 9</td>
</tr>
</tbody>
</table>
Age-Specific (Crude) Total US Mortality Rates
For Breast Cancer, Females, For 1994-2003
Numbers of new cases and age specific incidence rates, by sex, breast cancer, UK 2003

- Male cases
- Female cases
- Male rates
- Female rates

<table>
<thead>
<tr>
<th>Age at diagnosis</th>
<th>Male cases</th>
<th>Female cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>5,000</td>
<td></td>
</tr>
<tr>
<td>5-9</td>
<td>6,000</td>
<td></td>
</tr>
<tr>
<td>10-14</td>
<td>7,000</td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>20-24</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>25-29</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>30-34</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>35-39</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td>40-44</td>
<td>1,000</td>
<td></td>
</tr>
<tr>
<td>45-49</td>
<td>1,200</td>
<td></td>
</tr>
<tr>
<td>50-54</td>
<td>1,400</td>
<td></td>
</tr>
<tr>
<td>55-59</td>
<td>1,600</td>
<td></td>
</tr>
<tr>
<td>60-64</td>
<td>1,800</td>
<td></td>
</tr>
<tr>
<td>65-69</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td>70-74</td>
<td>2,200</td>
<td></td>
</tr>
<tr>
<td>75-79</td>
<td>2,400</td>
<td></td>
</tr>
<tr>
<td>80-84</td>
<td>2,600</td>
<td></td>
</tr>
<tr>
<td>85+</td>
<td>2,800</td>
<td></td>
</tr>
</tbody>
</table>

Rate per 100,000 population

- Male rates
- Female rates
Breast Cancer Risk Factors

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<table>
<thead>
<tr>
<th>Oral contraceptive use</th>
<th>Relative risk (confidence interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never users</td>
<td>1.0</td>
</tr>
<tr>
<td>Current users</td>
<td>1.24 (1.15-1.33)</td>
</tr>
<tr>
<td>1-4 years after stopping</td>
<td>1.16 (1.08-1.23)</td>
</tr>
<tr>
<td>5-9 years after stopping</td>
<td>1.07 (1.02-1.13)</td>
</tr>
<tr>
<td>10+ years after stopping</td>
<td>1.01 (0.96-1.05)</td>
</tr>
</tbody>
</table>

**Oral contraception and the relative risk of breast cancer**
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• Why are risk factors for BC?
• **What are features of BC in China?**
• What should be done for controlling BC?
Chinese Experienced Changes in 40 years that Westerner took 400 years to experienced

• Changes in city’s dinner table (82-02)
  – Meat: ↑ 62g-104g) fish (22-45)
  – Rice: ↓ 70g-47g
  – % Fat: ↑ (25%-35.4%)
Chronic diseases are increasing rapidly.

<table>
<thead>
<tr>
<th>Disease Type</th>
<th>Year</th>
<th>Rate</th>
<th>Increase from Previous Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>2002</td>
<td>18.8%</td>
<td>31%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>2002</td>
<td>6.4%</td>
<td>-</td>
</tr>
<tr>
<td>Obese</td>
<td>2002</td>
<td>22.8%</td>
<td>39%</td>
</tr>
<tr>
<td>Obese</td>
<td>2002</td>
<td>7.1%</td>
<td>97%</td>
</tr>
<tr>
<td>Lipid abnormalities</td>
<td>2002</td>
<td>18.6%</td>
<td>-</td>
</tr>
</tbody>
</table>

*Note: Numbers are approximate and may not reflect exact values.*
图 20 1988-1997 年不同经济发达城市乳腺癌年龄别发病率变化趋势
图 21 1997-2000 中美乳腺癌年龄别发病率比较
Female Cancer Morbidity, Beijing, China, 1998-2002

- Breast: 22%
- Lung: 18%
- Colon: 6%
- Cervical: 2%
- Others: 52%
Female cancer mortality, Beijing, 1998–2002

- Breast: 8%
- Lung: 27%
- Others: 59%
- Cervical: 1%
- Colon: 5%
Female cancer morbidity, Shanghai, 1998–2002

- Breast: 18%
- Lung: 13%
- Colon: 9%
- Cervical: 2%
- Others: 58%
Female cancer mortality, Shanghai, 1998–2002

- Breast: 8%
- Lung: 19%
- Colon: 8%
- Cervical: 1%
- Others: 64%
Female cancer morbidity, Wuhan, 1998–2002

- Breast: 19%
- Lung: 14%
- Colon: 5%
- Cervical: 2%
- Others: 60%
Female cancer mortality, Wuhan, 1998-2003

- Breast: 10%
- Lung: 19%
- Colon: 4%
- Cervical: 2%
- Others: 65%
shanghai

- High intake of meat, age 40-49, high education, style of working, late age of first full term pregnancy, often eat deep-fry food, early drinking tea, and soy product intake.
Wuhan

- Oral contraceptive, style of working, ovariotomy, education, SES, dysmenorrhea, menopause, smoke-dried food, passive smoking.
Breast Cancer in China

- BC in China is increasing rapidly
- This increase results mainly from metropolitan female at reproductive age
- Highest risk age group at 40-49, which is earlier than that in developed countries (50-79 ys)
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- Highest risk age group at 40-49, which is earlier than that in developed countries (50-79 ys)
Breast Cancer in China

• Highest risk age group’s characteristics:
  – High education level
  – Engaging in scientific research
  – Depress
  – High BMI
  – High protein intake
  – Disharmonious marital life/divorce
Breast Cancer in China

- Highest risk age group’s characteristics (cont’):
  - Induced abortion
  - Late age at first pregnancy
  - Oral contraceptive use
  - Lack of lactation
  - Benign breast disease
  - Family history of BC
  - Late menopause
  - Passive smoking
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Controlling Strategies

• Women’s health management
  – Improve mental health
  – Suitable age to get marriage and pregnancy
  – Reduce induce abortion
  – Encourage breastfeeding and prolong lactation period
Controlling Strategies

- Women’s health management
  - Plan based food not animal based food
  - Exercise
  - No smoking/less drinking
  - Early detection
Acknowledgement

• The european disability weights project, michelle e. Kruijshaar, jan j. Barendregt and the European disability weights group, the breast cancer related burden of morbidity and mortality in six European countries, European journal of public health 2004; 14: 141–146
• 全国肿瘤防治研究办公室等,中国部分市、县恶性肿瘤的发病与死亡, 人民卫生出版社, 2007
Thank You
Q & A