HPV Subtype vs HPV Virus Load

Population-Based Study on the Prognostic Value of High-Risk Human Papillomavirus Subtype and Virus Load Tests for Cervical Intraepithelial Neoplasia

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Disclosure

Nothing to Disclose
Cervical cancer affects nearly 500,000 women around the world every year and kills more than 270,000 women, and 80% of them live in the developing countries.
Globe Cancer Statistics (1,000人/year)

- Breast: Developed 692, Developing 691
- Colon: Developed 338, Developing 232
- Cervix: Developed 77, Developing 453
- Lung: Developed 242, Developing 272
- Stomach: Developed 102, Developing 247
- Uterine: Developed 142, Developing 145
- Live: Developed 40, Developing 186
- Ovary: Developed 100, Developing 125
- Thyroid: Developed 74, Developing 89

IARC, Globocan 2011
Cervical cancer is ranked first in the female Reproductive Tract Cancers!
Two-cancers screening  Nationwide Program from 2009  
(Cervical Cancer and Breast Cancer)

About 10,000,000 women were screened every year.

The lack of cyto-pathologists couldn’t be improved in short time, which posed a great challenge to the cytology-based screening programs.
From 2014, the **HPV** test was used as the primary screening for cervical cancer in China

**HPV load or subtypes**

**What kind of HPV Screening is the cost-benefit population-based screening?**

**Triage of the positive cases after the primary HPV screening is a potential solution**
Cervical Cancer Prevention

Human Papillomavirus (HPV) causes virtually all cervical cancers.

Cervical cancer is nearly 100% preventable, and this epidemic needs to end!
HR-HPV Primary Screening

HPV(+)

HPV Test

31 33 35
39 45 51
52 56 58
59 66 68
16 18

Other 12 hrHPV+

16+ 18+

Pap

≥ASC-US

Co-test followup Pap+HPV

Colposcope

CSCCP (2016)
Two HPV screening triages in “Two Cancers” screening project

HPV (+) Pap

HPV 16, 18
Value of high-risk human papillomavirus viral load test and subtypes test in predicting cervical intraepithelial neoplasia based a prospective cohort study (2013---2015)

2257 women were screened in 3 population-based studies

HC-2 (n=2257)
HybriMax genotypes

Screen positive (n=361)
HC-2 or HybriMax positive

Colposcopy (n=550)
Biopsies were taken for pathological diagnosis

CIN2+ (n=46)
Appropriate

Normal or CIN1 (n=504)

Screen negative (n=1896)

Randomly selected (n=189)

575 were excluded

Follow up 24m (n=1636)
Supported by Chinese Anti-Cancer Association (CACA)
Cervical Cancer Prevention Research Project in Jiangxi Province

- 3 years · 3 rural areas (Jing'an County, Xingguo County, and Suichuan County)

HC-2
RLU/Cutoff value ≥ 10.0
≥ 1.0 and < 9.99

High load
Low load
Negative ( - )
The results of the baseline screening and the distribution of cervical lesions

**Table 1: Relationship of cervical lesions and HPV virus load in baseline of 2257 women**

<table>
<thead>
<tr>
<th>HPV status</th>
<th>Pathological diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NIL/M (n=2114)</td>
</tr>
<tr>
<td>Negative</td>
<td>1918 (90.73)</td>
</tr>
<tr>
<td>Low load</td>
<td>110 (5.20)</td>
</tr>
<tr>
<td>High load</td>
<td>86 (4.07)</td>
</tr>
</tbody>
</table>

*CIN3+: CIN grade 3 or worse; ( % )

The results of the baseline screening and the distribution of cervical lesions
The results of the baseline screening and the distribution of cervical lesions

Table 2: Relationship of cervical lesions and type-specific HPV in baseline of 2257 women

<table>
<thead>
<tr>
<th>Type-specific HPV</th>
<th>Pathological diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NIL/M (n=2114)</td>
</tr>
<tr>
<td>Negative</td>
<td>1878 (88.84)</td>
</tr>
<tr>
<td>Any other 13 pos.</td>
<td>132 (6.24)</td>
</tr>
<tr>
<td>HPV16 or 18</td>
<td>104 (4.92)</td>
</tr>
</tbody>
</table>

*CIN3+: CIN grade 3 or worse; ( )

The difference in the HPV16/18 infection rate between the CIN2+ group and the lesion-free group was statistically significant \((P<0.01)\)
Based on the pathology, 2 years follow up was carried on the women whose HPV test was negative, or positive but biopsy confirmed lesion-free or CIN 1.

2257 women were screened in 3 population-based studies

HC-2 (n=2257) HybriMax genotypes

Screen positive (n=361) HC-2 or HybriMax positive

Colposcopy (n=550) Biopsies were taken for pathological diagnosis

CIN2+ (n=46) Appropriate

Randomly selected (n=189)

Follow up 24m (n=1636)

Screen negative (n=1896)

575 were excluded

Normal or CIN1 (n=504)
<table>
<thead>
<tr>
<th>Baseline of HPV status or Subtype</th>
<th>No. of Participants</th>
<th>No. of CIN2+</th>
<th>RR (95%CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HC-2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>1394</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Low load</td>
<td>110</td>
<td>1</td>
<td>12.67 (0.79~201.2)</td>
</tr>
<tr>
<td>High load</td>
<td>132</td>
<td>5</td>
<td>52.80 (4.76~375.2)</td>
</tr>
<tr>
<td><strong>HybriMax</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>1314</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Any other 13 positive</td>
<td>163</td>
<td>2</td>
<td>16.12 (2.50~231.1)</td>
</tr>
<tr>
<td>HPV16 or 18</td>
<td>159</td>
<td>4</td>
<td>33.06 (3.72~293.9)</td>
</tr>
</tbody>
</table>
Association of CIN2+ progression with HPV subtype infections and HPV loads in 24-month follow up (%)

2年后CIN2+累计发生率（%）

- ▲ HC2 负载>10
- ▲ HC2 负载<10
- × HybriMax（-）
- × HPV其他13型(+)
- ○ HPV16,18(+)

HPV baseline
The achievements in the preventive treatment of cervical cancer in the rural area of Jiangxi province
The achievements in the rural area of China

The WHO Health System Framework

Leadership

Government

Screening

Tech

Health education

Health System Framework
Ministry of Health of the People’s Republic of China had launched “screening-for-two-cancers program” (Cervical Cancer and Breast Cancer).

Free Cervical Cancer Screening Program for 50 million women in rural area launched, and 10 million women had accepted the screening.

10 million women in about 200 counties joined in the cervical cancer screening program.

Complete the Free Cervical Cancer Screening Program for 50 million women.
Thank You!