Chapter 2.a. Visual screening for cervical neoplasia

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Screening and diagnosis – Visual screening for cervical neoplasia

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Visual screening for cervical neoplasia (1)

- Visual screening
  - with acetic acid (VIA):
    examination of the uterine cervix with the naked eye under bright light from a halogen focus lamp 1 minute after application of 3-5% dilute acetic acid
  - with Lugol’s iodine (VILI):
    visualisation immediately after application of Lugol’s iodine
Visual screening for cervical neoplasia (2)

- Simple, widely feasible and affordable
- Allow for “see and treat” sessions
- Can be provided by a wide range of health workers including doctors, nurses, midwives and primary health care workers
- Issue: subjective in nature and provider dependent tests
Challenges

• Quality assurance for visual screening
  - visual screening is dependent on the full visibility of the transformation zone of the cervix
  - difficult interpretation of both VIA and VILI in postmenopausal women
## Accuracy of screening tests in developing countries: range in sensitivity and specificity

<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cytology</td>
<td>31-78%</td>
<td>91-99%</td>
</tr>
<tr>
<td>HPV testing</td>
<td>61-90%</td>
<td>62-94%</td>
</tr>
<tr>
<td>VIA</td>
<td>50-96%</td>
<td>44-97%</td>
</tr>
<tr>
<td>VILI</td>
<td>44-93%</td>
<td>75-85%</td>
</tr>
</tbody>
</table>

Instruments and supplies

- Examination table
- Light source
- Bivalved speculum
- Instrument tray
  - cotton swabs
  - examination gloves
  - 4% acetic acid (or white vinegar)
  - Lugol’s iodine solution
  - 0.5% chlorine solution
  - report form for the result
VIA test

• Inspect external genitalia
• Insert speculum and reveal cervix
• Visually check for evidence of infection
• Remove discharge
• Identify cervical os and squamocolumnar junction (SCJ)
• Apply acetic acid to cervix, wait 1 minute
• Inspect SCJ and any lesion found
• Document the findings
• Remove any remaining acetic acid
• Remove the speculum
Reporting VIA test results (1)

• **Negative or Normal** (-) is scored when any of the following occur:

  I. No acetowhite lesions

  II. Bluish white lesions or faint patchy lesions or undefined lesions without definite margins

  III. Polyp protruding from the os taking up acetowhite

  IV. Nabothian cysts taking up acetowhite and appearing as whitish acne (pimples)

  V. Faint line-like acetowhiteness at the junction of columnar and squamous epithelium
Reporting VIA test results (2)

- **Negative or Normal** (-) is scored when any of the following occur:

  VI. Acetowhite lesions far away from the transformation zone

  VII. Streak-like acetowhiteness

  VIII. Dot-like areas in the endocervix, which are due to grape-like columnar epithelium staining with acetic acid

  IX. When there are shiny or cloudy-white lesions with ill-defined, indefinite margins
VIA negative: No acetowhite areas seen.
VIA negative: No definite acetowhite areas. The squamocolumnar junction (SCJ) is accentuated as a white line after application of 4% acetic acid.
VIA negative: Ectropion: the SCJ is prominent after the application of acetic acid. Note the translucent, glassy, pinkish white membrane like immature squamous metaplastic epithelium (arrows).
VIA negative: The streak-like irregular acetowhite areas are due to squamous metaplasia. There are satellite lesions detached from the SCJ.
**VIA negative:** The Nabothian cysts appear as pimple-or button-like areas after the application of acetic acid.
Reporting VIA test results

• **Positive (+)** is scored when any of the following occur:
  - Distinct, well defined, dense, opaque or dull white or oyster white acetowhite areas touching the squamocolumnar junction (SCJ) or touching the external os (if SCJ is not seen)
  - Circumferential white lesion surrounding the os
  - The whole cervix turns white after application of acetic acid

• **Invasive cancer** is scored if there is clinically visible ulceroproliferative growth on the cervix that bleeds on touch
VIA positive: Note the opaque acetowhite areas arising from the SCJ in the anterior lip.
VIA positive: Note the thick, densely opaque, well-defined acetowhite lesion touching the SCJ in the lower lip.
VIA positive: Note the dense acetowhite area all over the cervix involving all the four quadrants and extending into the cervical canal.
**VIA positive, invasive cancer:** There is a circumferentially raised, dull, chalky-white lesion with irregular surface and several bleeding points on touch involving the cervix.
VIA positive, invasive cancer: The dense acetowhite area with irregular surface area is partly obscured by bleeding.
VIA positive, invasive cancer: There is an ulceroproliferative growth with acetowhitening and bleeding.
**VIA NEGATIVE**

- No definite acetowhite area
- Acetowhiteness of the mucus on columnar epithelium
- Mucus plug
- Nabothian cysts
- Polyp
- Acetowhite area far away from Squamocolumnar junction

**VIA POSITIVE**

- Well-defined, acetowhite lesions touching the Squamocolumnar junction or close to the os

**CANCER**

- Acetowhiteness on the entire cervix
- Acetowhiteness of growth on the cervix
- Acetowhiteness of growth on the cervix; partly obliterated by bleeding

VILI test

- Can be used immediately after VIA screening for additional information

- Reaction with glycogen in the cervical epithelium:
  - Normal squamous epithelium tint brown or black
  - Normal columnar epithelium, immature squamous metaplastic epithelium and cervical neoplasia remain colourless
  - Can turn mustard or saffron yellow in the case of cervical neoplasia
Reporting VILI test results

- **VILI negative (-)** is scored when any of the following occur:
  - The squamous epithelium is black and the columnar epithelium does not change colour after the application of iodine.
  - There are patchy areas of no or partial uptake of iodine in the transformation zone corresponding to area of immature squamous metaplasia.
  - There are patchy iodine non-uptake areas, scattered all over the cervix, not restricted to the transformation zone.
  - There are pepper-like iodine non-uptake areas in the squamous epithelium.
VILI negative: The squamous epithelium is black and the columnar epithelium does not change colour after the application of iodine.
**VILI negative:** Squamous epithelium remains brown. There are patchy areas of no or partial uptake of iodine in the transformation zone corresponding to area of immature squamous metaplasia and inflammation.
**VILI negative**: There are patchy iodine non-uptake areas, scattered all over the cervix, not restricted to the transformation zone. This is characteristic of chronic cervicitis.
**VILI negative**: There are pepper-like iodine non-uptake areas in the squamous epithelium due to cervical ulceration due to inflammation.
**VILI negative**: The iodine negative, irregular yellow areas are detached from the squamocolumnar junction and constitute ‘satellite’ lesions.
Reporting VILI test results

• **VILI positive (+) is scored**
  
  when dense, thick, bright, mustard or saffron yellow iodine-negative areas are seen in the cervix, close to the squamocolumnar junction or when the entire cervix appears mustard yellow.
VILI positive: There is a saffron-yellow iodine non-uptake area in the anterior lip abutting the squamocolumnar junction.
**VILI positive**: There is a mustard yellow lesion with no iodine uptake in the anterior lip touching the squamocolumnar junction.
VILI positive: There is a mustard yellow iodine non-uptake area in the anterior lip abutting the squamocolumnar junction.
**VILI positive**: There is a dense, mustard yellow iodine non-uptake area abutting the squamocolumnar junction in the anterior lip of the cervix with irregular, angular margins.
**VILI positive, invasive cancer:** There is a large, dense, saffron yellow iodine non-uptake area with irregular surface, involving all the four quadrants and extending into the cervical canal.
VILI positive, invasive cancer: There is a large, mustard yellow iodine non-uptake area with irregular surface, involving all the four quadrants of the cervix and extending into the cervical canal.
**VILI positive, invasive cancer:** There is a large, thick mustard yellow area in the cervix with irregular, nodular surface contour.
Randomised controlled trial of the screen and treat approach for cervical cancer prevention in South Africa

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>HPV test &amp; treat N=2163</th>
<th>VIA &amp; treat N=2227</th>
<th>Delayed evaluation N=2165</th>
</tr>
</thead>
<tbody>
<tr>
<td>6m post-randomisation evaluated women CIN2+ prevalence</td>
<td>1879</td>
<td>1929</td>
<td>1859</td>
</tr>
<tr>
<td></td>
<td>15 (0.8%)</td>
<td>43 (2.2%)</td>
<td>65 (3.5%)</td>
</tr>
<tr>
<td>CIN2 prevalence 12m post-randomisation</td>
<td>25 (1.4%)</td>
<td>54 (2.9%)</td>
<td>92 (5.45)</td>
</tr>
</tbody>
</table>

Source: Denny et al., JAMA, 2005; 294:2173-81
Cluster randomised trial of visual screening for cervical cancer in rural South India: Dindigul District cervical screening study, Tamil Nadu, India (1)

Flow chart of study results

Source: Sankaranarayanan et al., Lancet, 2007;370:398-406

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Overall and age-specific hazard ratio for incidence of all cervical cancers and for cervical cancer deaths

<table>
<thead>
<tr>
<th></th>
<th>Hazard ratio (95% CI)*</th>
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<tbody>
<tr>
<td><strong>Control group</strong></td>
<td><strong>1.00</strong></td>
</tr>
<tr>
<td><strong>Intervention group</strong></td>
<td></td>
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<tr>
<td><strong>Overall</strong></td>
<td></td>
</tr>
<tr>
<td>Cervical cancer incidence</td>
<td>0.75 (0.59-0.95)</td>
</tr>
<tr>
<td>Cervical cancer deaths</td>
<td>0.65 (0.47-0.89)</td>
</tr>
<tr>
<td><strong>30-39 years</strong></td>
<td></td>
</tr>
<tr>
<td>Cervical cancer incidence</td>
<td>0.62 (0.40-0.96)</td>
</tr>
<tr>
<td>Cervical cancer deaths</td>
<td>0.34 (0.18-0.66)</td>
</tr>
<tr>
<td><strong>40-49 years</strong></td>
<td></td>
</tr>
<tr>
<td>Cervical cancer incidence</td>
<td>0.82 (0.55-1.24)</td>
</tr>
<tr>
<td>Cervical cancer deaths</td>
<td>0.55 (0.31-1.00)</td>
</tr>
<tr>
<td><strong>50-59 years</strong></td>
<td></td>
</tr>
<tr>
<td>Cervical cancer incidence</td>
<td>0.76 (0.50-1.16)</td>
</tr>
<tr>
<td>Cervical cancer deaths</td>
<td>0.99 (0.58-1.66)</td>
</tr>
</tbody>
</table>

* C.I.: Confidence interval
Source: Sankaranarayanan et al., Lancet, 2007;370:398-406
Cluster randomised trial of visual screening for cervical cancer in rural South India: Dindigul District cervical screening study, Tamil Nadu, India (3)


Source: Sankaranarayanan et al., Lancet, 2007;370:398-406
Thank you

This presentation is available at
www.uicc.org/cervicalcancercurriculum