EFCS Symposium

Is cervical cancer screening based on HPV testing with cytology triage as safe as perceived?

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Is cervical cancer screening based on HPV testing with cytology triage as safe as perceived?

- Safety of screening depends on accuracy of the test, risk of disease and screening coverage
- Screening coverage (acceptance of invitations) depends on perceptions of accuracy and risk
- Preceptions depend on information provided by the NHS and the way it is promoted by the media (probably including social media)
Current information about HPV testing

- Information about ‘smear tests’ is provided by the websites of NHS cancer screening and Jo’s (cervical cancer) Trust, which provides a link to Cancer Research UK cervical cancer mortality and incidence statistics and refers to an article by Peto et al. (Lancet 2004) ‘The cervical cancer epidemic that screening has prevented’

Current information about HPV testing

• With all this largely positive information, why is the public perception of the effectiveness of cytological screening rather negative? At least, in the UK?
Comparison between cytological screening and new technology

- Every new development (automation, liquid-based cytology, vaccination, HPV testing) is promoted as being better than the ‘smear test’, which is persistently so-called although the UK has moved to LBC for most of the last decade.

- Accuracy of conventional screening has stood up well in all UK trials compared with new technology (e.g. HART, TOMBOLA, MAVARIC, ARTISTIC).
Comparison between cytological screening and new technology

- Vaccination is promoted as preventing 75% of invasive cervical cancers, which is about the same as achieved by cytological screening.

- However, vaccination will prevent precancerous changes as well as cancers and will reduce the prevalence of abnormalities - which is why primary HPV testing is being introduced.
Media information about HPV testing

- Recent proposal to introduce HPV testing after successful pilot site programmes has been reported by the BBC and newspapers, including the Daily Mail, with several rather negative messages about cytological screening.

- Several questions can be raised about comments in these reports, and answered by examining the statistics available on the Cancer Research UK website.
HPV cervical cancer test introduced in England

The NHS in England is introducing a "superior" test for cervical cancer, following a successful pilot programme.

Experts say it is a switch that could pick up an extra 600 cancers a year.

Experts say testing for "risky" HPV infections will help prevent more cervical cancers, as it can pick up the cancer-causing infection before any abnormalities can develop or be seen in the cells of the neck of the womb (the cervix).

Women who test negative for HPV can be advised that their risk of cancer is incredibly low and remain on the routine screening schedule.

Public Health Minister for England Jane Ellison said: "These changes are a breakthrough in the way we test women for cervical disease. The new test is more accurate, more personal and will reduce anxiety among women."

Sir Harpal Kumar, of Cancer Research UK, said the change was a welcome one.

"The need for improvements to the cervical screening programme was set out in the cancer strategy for England last year, so it's good to see progress being made," he said.
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Experts say testing for "risky" HPV infections will help prevent more cervical cancers, as it can pick up the cancer-causing infection before any abnormalities can develop or be seen in the cells of the neck of the womb (the cervix).

Women who test negative for HPV can be reassured that their risk of cancer is incredibly low and remain on the routine screening schedule.

Public Health Minister Dr Jane Ellison said: "This new strategy will provide an early warning system for cervical cancer.

Sir Harpal Kumar, CEO of Cancer Research UK, said: "The need for increased awareness and better testing and earlier diagnosis is vital to halting the rising number of cases of cervical cancer in England last year.

No mention that specificity of HPV testing is so low that cytology and colposcopy triage are needed to find any abnormalities to treat.

The Daily Mail says ‘could prevent’
Incredibly low? With a false negative rate of around 5-15%
A brief look at the Cancer Research UK statistics available on their website demonstrates how successful cytological screening has been during the last 25 years and what improvements were and now are needed.
Millions of women to be offered new cervical cancer test which could prevent 600 new cases a year

- From tomorrow, Government will begin using test in surgeries and clinics
- Should be available nationwide in two years' time, it was announced today
- The new test is far more accurate than the current smears women undergo
- Works by identifying the HPV virus which triggers nearly all tumours

By SOPHIE BORLAND HEALTH EDITOR FOR THE DAILY MAIL
The new test is a more accurate version of the smear and identifies whether the HPV virus is present in cells, which is behind 97 per cent of tumours.

If this is found, women would be sent to have more frequent checks and if necessary surgery to remove abnormal cells before they have the chance to grow into tumours.

It is far more accurate than the current smear test which relies on cell experts in the lab, cytologists, looking down a microscope to check for abnormalities.

This is very subjective and has led to tumours being missed as well as other healthy women undergoing surgery needlessly.
Accuracy is defined by sensitivity and specificity of finding the condition itself or one can be treated to prevent it.

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No mention that specificity of HPV testing is so low that it relies on the same cell experts to look down a microscope to see whether any abnormalities are present.

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A new test for cervical cancer to be offered to millions of women should prevent hundreds of cases each year.

From tomorrow, the Government will begin rolling out the test in surgeries and clinics and it should be available nationwide in two years’ time.

The new test is far more accurate than the current smears and works by identifying the HPV virus which triggers nearly all tumours.

Experts hope it will prevent 600 cancers a year and save lives by flagging up abnormalities long before tumours have had the chance to appear.

There are around 3,000 cases of cervical cancer in the UK a year and it is most common in women under the age of 45.

Sadly, it leads to 900 deaths a year and many of the victims are young women in their 20s and 30s embarking on careers or starting families.
Jade Goody was first screened when she was under 25 years of age, her cytology test (LBC) was abnormal, she admitted that she did not take the advice she was given, and she had no complaint with the NHS Cervical Screening Programme.
A brief look at the Cancer Research UK statistics available on their website demonstrates how successful cytological screening has been during the last 25 years and what improvements were and now are needed.

Cervical Cancer (C54), European Age-Standardised Mortality Rates, Females, UK, 1971-2012

Rate per 100,000

1971 to 1988

1982
Cancer Research UK: incidence 1979-2013

Cervical Cancer (C53), European Age-Standardised Incidence Rates, Great Britain, 1979-2013

1979 to 1988

‘Jade Goody effect’
Cancer Research UK: carcinoma in situ 1979-2013 (CIN3 and AIS)

1982 to 1988

Rate per 100,000

Year of Diagnosis

1979 2013
Increase in risk of cervical cancer and its precursors in the 1980s in young women in England

Rates per 100,000 women in each age band

5-year age bands

1971 (17.2) 1986 (18.0)
Increased risk (birth cohort effect) and poor quality control (uptake was quite good in young women) caused increases in HSIL, CIN3, incidence and mortality

- Abnormal cervical smears: are we in for an epidemic? Wolfendale M. et al. BMJ 1983
- Herbert A. Cervical screening in England and Wales: its effect has been underestimated. Cytopathology 2000
Success of screening after the implementation of the NHS cervical screening programme in England

Rates per 100,000 women in each age band

- 1971 (17.2)
- 1986 (18.0)
- 2001 (9.8)

(n) = rate in year per total 100,000

5-year age bands
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The NHS in England is introducing a "superior" test for cervical cancer, following a successful pilot programme.

Experts say it will help catch the cancer-causing infection before it can develop or be seen in the cells of the neck of the womb (the cervix).

Women who test negative for the virus will be advised that their risk of cancer is incredibly low and remain on the routine screening schedule.

Public Health Minister for England, Jane Ellison said: "These changes are a breakthrough in the way we test women for cervical disease. The new test is more accurate, more personal and will reduce anxiety among women.

Sir Harpal Kumar, of Cancer Research UK, said the change was a welcome one.

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Cancer Research UK: incidence by age 1979-2013

Cervical Cancer (C53), European Age-Standardised Incidence Rates by Age, Great Britain, 1979-2013
Incidence has increased at 25-29 and 30-34 due to i) falling screening uptake, ii) delaying the first screening invitation from 20 to 25 (in England) and saying it caused ‘more harm than good’ (unlike the 1980s, many of these cancers are early and screen-detected) and iii) a probable high-risk birth cohort.
Recent increase in cervical cancer incidence in young women in England (latest ONS data)

Rates per 100,000 women in each age band

(\text{n}) = \text{rate in year per total 100,000}

- 1971 (17.2)
- 1986 (18.0)
- 2001 (9.8)
- 2014 (9.5)
What improvements are needed now?

- Improved uptake of invitations, which could result from a new test perceived to be better
- A system that can cope with falling prevalence of abnormalities in vaccinated women
- A system with high sensitivity and specificity, which can distinguish potentially progressive from potentially reversible abnormalities
- A system for surveillance of potentially reversible abnormalities at risk of persistence
• **Sensitivity:** HPV is higher than ‘average’ cytology (most trials) and is about the same as high-quality cytology (ARTISTIC), but the risk of false negative tests is not ‘incredibly low’

• **Specificity:** HPV testing depends on cytology and colposcopy to increase its low specificity

• **Cytology:** is the best method of distinguishing HSIL from LSIL/ASC-US

• **Time:** is the best method of distinguishing reversible from progressive lesions and requires protocols for surveillance of all the women having ‘more frequent checks’
Is the cervical cancer screening based on HPV testing with cytology triage as safe as perceived?

- Probably not unless the imperfections of HPV testing are admitted (less than 100% sensitivity and very low specificity)
- Probably not unless the important roles of cytology and colposcopy for improving specificity are appreciated and maintained
- Probably not without alternatives to cytological surveillance of lesions not requiring treatment
What is the answer?
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The clue lies in the high prevalence of CIN3 in early rounds of screening (peak at 25-29)
It’s obvious (after avoiding all the negative messages)
• Limited HPV/cytology co-testing for the first high-prevalence rounds of screening followed by HPV tests alone at extended intervals
• Follow-up co-testing in colposcopy clinics for women not needing treatment as well as test of cure
Thank you for listening