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Performance characteristics of visualising the cervix in symptomatic young females:

a review of primary care records in females with and without cervical cancer

Abstract

Background

The current strategy for timely detection of cervical cancer in young females centres on visualising the cervix when females present with gynaecological symptoms, but is based on expert opinion without an evidence base.

Aim

To assess visualising the cervix in primary care in young females with gynaecological symptoms.

Design and setting

A review of primary care records for females in England aged 20–29 years with cervical cancer (nationwide interview-based study) and in the general population (Clinical Practice Research Datalink database).

Method

From primary care records the proportion of females was identified with gynaecological symptoms who had documented cervical examination in the year before diagnosis (cancers) and in 1-year age bands (general population). Of these, the proportion was identified that was then referred for suspected malignancy.

Results

Only 39% of young females with cervical cancer had documented examination at symptomatic presentation. Visualisation resulted in referral for suspected malignancy for 18% of those examined [95% confidence interval = 5% to 40%]. Very few (<1.7%) symptomatic females in the general population had documented cervical examination. None were referred for suspected malignancy at the time.

Conclusion

The sensitivity of cervical examination to detect cancer is very low, highlighting the need for better triage tools for primary care. Until such tools are identified GPs should continue to consider cervical cancer when symptoms persist and the cervix is not obviously abnormal on clinical examination. Further research on additional triage tools such as cervical cytology used as a diagnostic aid is needed urgently.

Keywords

cervical cancer; early diagnosis; female; gynaecological examination; primary care; symptom assessment; young adult.

INTRODUCTION

In England, clinical practice guidelines on the diagnosis of cancer¹ recommend visualising the cervix of young females who present to primary care with persistent abnormal vaginal bleeding to facilitate timely diagnosis of young females with cervical cancer. In addition, recent National Institute for Health and Care Excellence (NICE) guidelines² state that a suspected cancer pathway referral should be considered if 'the appearance of their cervix is consistent with cervical cancer'. No such guidelines exist in the US; however, a committee opinion from the American College of Obstetricians and Gynecologists' Committee on Gynecologic Practice recommends a similar approach.³ In reality there is very little supporting evidence for this activity. This has been a major criticism of the guidelines.⁴ The key challenge is that gynaecological symptoms are common⁵ in young females, whereas malignancy is rare. Furthermore, early-stage cancers are difficult to see with the naked eye.^{6,7}

The present study assesses visualising the cervix in primary care in young females with gynaecological symptoms.

METHOD

The Department of Health clinical practice guidelines¹ focus on females aged 20–24 years (that is, below the recommended age for cervical screening).

The present study considers females aged 18–29 years because most (89%) females with cervical cancer in this age group report having symptoms prior to diagnosis.⁸ Furthermore, screening coverage is low in females aged 25–29 years (63.3%)⁹ and therefore a substantial proportion of cervical cancers in young females will be diagnosed via symptomatic presentation.

Two data sources were used. First, primary care record data were examined from a nationwide interview-based study of young females aged 18–29 years diagnosed with cervical cancer in England between November 2010 and March 2012 (detailed methods are described elsewhere).⁸ Young females were identified prospectively for interviews inquiring about their history of presentation and events leading to diagnosis. GP primary care record data and cervical screening history (from the national screening database Exeter Call/Recall System) were obtained for females who provided specific consent. An estimated 38% of all young females in England with newly diagnosed cervical cancer were recruited. The entire consultation record (including coded data and free text) was used to identify the first documented cervical examination when presenting with a gynaecological symptom (Box 1) in the year before diagnosis. Findings were categorised as 'normal cervix', 'benign cervical pathology' (cervical polyp, ectopy, nabothian follicles or friable

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Box 1. Gynaecological symptoms

- Postcoital bleeding
- Intermenstrual bleeding
- Bleeding during pregnancy
- Change in menstrual periods
- Dyspareunia
- Vaginal discharge

How this fits in

UK guidelines focus on visualising the cervix for diagnosis of cervical cancer when young females present to primary care with gynaecological symptoms. However, primary care records show that documented cervical examination is rare in young females with cervical cancer (39%) and misses most cancers (82%). The sensitivity of cervical examination to detect cancer is very low. Further research on additional triage tools, such as cervical cytology used as a diagnostic aid, is needed urgently.

cervix/bleeding on contact), or a 'suspicious cervix'. The proportion referred urgently to colposcopy on the basis of abnormal examination findings was identified.

The second dataset comprised anonymous electronic medical records obtained from the Clinical Practice Research Datalink (www.cprd.com) database.⁵ The CPRD holds data from more than 600 primary care practices in the UK. The sample included consultation records for 45 484 females aged 20–29 years during the years 1990–2010. Consultation data were provided as medical codes. To protect anonymity, only the year of birth was supplied; 1 July was assigned to estimate the date of birth. Estimates were made of the proportion of females who presented with a gynaecological symptom when aged 20–29 years in 1-year age bands; the proportion of these who had codes for cervical examination within 14 days after

presenting; and, of these females, the proportion referred to colposcopy. Analyses were carried out in Stata (version 13).

RESULTS

Primary care record data were available for 107 (84%) of the 128 females recruited to the nationwide interview-based study (age range 22–29 years). Fifty-two per cent (56 of 107) of young females with cervical cancer had gynaecological symptoms recorded in their primary care records in the year before diagnosis (a much higher percentage, 89%, reported symptoms at interview). Of these, 39% (22 of 56) had a documented cervical examination at the time of symptomatic presentation. This resulted in specialist referral for a clinically suspicious cervix in just four (18%, 95% confidence interval = 5% to 40%) females. Two further females whose cervix was not documented as 'suspicious' were also referred for urgent assessment: their findings on examination were recorded as 'normal' or 'red and friable'. Visualisation identified one of eight International Federation of Gynecology and Obstetrics (FIGO) stage 1A, and three of 14 stage 1B or worse, cervical cancers.

In the CPRD dataset, between 0.6% and 1.6% of females aged 20–29 years who presented with a gynaecological symptom had documented evidence of cervical examination within 14 days (Table 1). None resulted in colposcopy referral.

DISCUSSION

Summary

In primary care, visualisation of the cervix

Table 1. CPRD data for proportion of females aged 20–29 years presenting to primary care with gynaecological symptoms and the proportion of these who had documented evidence of cervical examination within 14 days

Age at symptom, years	Females, N ^a	Presented with a gynaecological symptom, N(%)	Presented with gynaecological symptoms and cervical examination within 14 days, N(%)
20	36 178	1897 (5.2)	14 (0.7)
21	34 743	1898 (5.5)	12 (0.6)
22	32 998	1801 (5.5)	18 (1.0)
23	31 051	1796 (5.8)	22 (1.2)
24	29 006	1709 (5.9)	14 (0.8)
25	26 817	1666 (6.2)	19 (1.1)
26	24 064	1603 (6.7)	25 (1.6)
27	21 169	1553 (7.3)	21 (1.4)
28	18 150	1343 (7.4)	18 (1.3)
29	15 012	1172 (7.8)	15 (1.3)

^aNumber of females with consultation data available at each given age at symptom, assuming consultation data were available for the entire period between the age at the first and last recorded events. CPRD = Clinical Practice Research Datalink.

is rarely documented in young females with cervical cancer who present with symptoms. Moreover, most even frankly invasive cancers appear to be missed by inspection in primary care, and very few females are referred for urgent assessment on the basis of visualisation alone. The low sensitivity of (unaided) clinical examination is unsurprising as microinvasive cancers are by definition very small and therefore difficult to see without magnification.^{6,7}

Symptomatic females in the general population (that is, CPRD data) were much less likely than those with cervical cancer to have a documented cervical examination, which probably relates to differences in the severity, frequency, or duration of symptoms.

Strengths and limitations

A key strength of the present study is that the data were recorded prospectively, eliminating recall bias. The study also benefits from the use of two datasets that are broadly representative of England.

The study is limited by the small number of cases; this is inevitable, as cervical cancer is rare in females aged <30 years. It is also probable that not all cervical examinations are recorded in medical notes and that recording may be biased towards cases.¹⁰ Furthermore, primary care records are known to be diagnosis driven¹¹ with a tendency for unexplained symptoms to be under-recorded. The present CPRD analysis relied entirely on coded data, meaning that symptoms and examinations that were only recorded in 'free text' would have been missed. This may have led to underestimates in symptom prevalence and the frequency of cervical examination; however, the additional data gained from free text has been shown to be minimal.¹² It is also notable that only a modest proportion of females with cervical cancer had documented cervix examination in the nationwide interview-based study, which included free-text and coded data.

Comparison with existing literature

As far the authors are aware this is the first study to assess visualising the cervix (unaided) in primary care in young females with gynaecological symptoms. Studies in low-resource settings,^{6,13} however, have shown that unaided visual inspection has a low positive predictive value for detecting cervical cancer. A study of asymptomatic females aged 30–64 years invited to attend an early-detection clinic in India found that unaided visual inspection detected between 7.2% and 24.8% of cervical cancers.⁶

In a study of urgent referrals for a clinically suspicious cervix to a colposcopy clinic in Aberdeen (Aberdeen Royal Infirmary), only 4% (4 out of 104) of females were found to have cervical cancer.¹⁴ In a similar but smaller audit of a colposcopy clinic in London (Whipps Cross University Hospital), only one female was found to have cervical cancer out of 25 who were referred with a clinically suspicious cervix.¹⁵ These poor conversion rates for referrals with a clinically suspicious cervix support the present findings and assertion that (unaided) visual inspection is largely inefficient at detecting cancer.

Implications for research and practice

NICE guidelines in England recommend that urgent referral should be considered if the cervix appears to be consistent with malignancy.² The present findings suggest that visual inspection of the cervix is inefficient at detecting cervical cancer. This highlights the need for additional triage tools for primary care physicians managing young females with gynaecological symptoms. One potential solution could be to use cervical cytology as a diagnostic test in symptomatic females in whom cancer is unlikely but possible. It has been shown recently that 89% of cervical cancers in females aged 25–64 years have moderate dyskaryosis or worse cytology (including 'borderline cannot exclude high-grade disease').¹⁶ Cytology as a diagnostic aid would have particular appeal in young females given that cervical screening is only recommended in females aged ≥25 years.¹⁷ Studies are planned that will examine the potential for this in more detail. Importantly, despite the limitations of cervical examination, the benefit of detecting cancers that are visible to the naked eye justifies its continued use and it is likely to continue to be used alongside additional triage tools.

Visualising the cervix with the naked eye is a blunt tool for detecting cervical cancer and should be re-evaluated as the primary recommendation in young females presenting with gynaecological symptoms. The potential for using cytology as a diagnostic aid warrants further exploration. Until then timely diagnosis of symptomatic cervical cancer will continue to rely on a careful history, visualising the cervix, and a clear message to females to re-attend if their symptoms persist. In addition, GPs should continue to consider cervical cancer when symptoms persist and the cervix is not obviously abnormal on clinical examination.

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Ethical approval

Ethical approval was obtained for the nationwide interview-based study from the North West London REC2 Ethics Committee (10/H0720/65) and for the CPRD study from the Independent Scientific Advisory Committee for the CPRD (approval was not required for the colposcopy audit).

Provenance

Freely submitted; externally peer reviewed.

Competing interests

The authors have declared no competing interests.

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