Using technology to harmonise treatment approaches in colposcopy in the face of a changing environment

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Introduction

UK colposcopy clinics are undergoing a period of dynamic change in response to the ongoing challenges posed by the new screening protocol, management, staffing, and the drive for colposcopists to improve clinical outcomes and patient experience.

Challenges of colposcopy

The initial challenge is adjusting to primary high-risk human papillomavirus (hrHPV) screening which has been established in the UK from 2020. Primary HPV testing has proven greater sensitivity for detection of cervical intraepithelial neoplasia (CIN) than cytology alone, or cytology with HPV triage, and has been shown to decrease the incidence of CIN2+ [1,2] Despite its high sensitivity, HPV screening has been shown to have lower specificity for CIN2 and CIN3 compared to cytology, increasing over-referral and the number of colposcopies and biopsies, leading to increased costs. Although there is reassurance from the Canadian experience where elevated rates fell two years after primary HPV screening implementation [1], it is expected that clinicians in England will see an initial increase in referrals of up to 40% post-implementation and pressure to discharge or see-and-treat [3].

ZedScan *I*

DYSIS Ultra

	Colposcopy alone	With ZedScan	With DYSIS
PPV	53-58%	67%	76%
Sens.	51%	88%	80%
Spec.	87%	65%	70%

Table 1: Impact of adjunct technology on colposcopy performance [13,14].

Alongside primary HPV screening, the generation of women who were vaccinated against HPV types 16 and 18 are now entering cervical screening and data from Scotland, where vaccination was introduced earlier, shows that only 32–38% of the high-risk HPV infections were presented in vaccinated women. And within that cluster, only 4.5–5% were HPV-16 or -18 positive, showing an encouraging outcome attributable to the vaccination [4,5]. This poses a challenge to clinicians, where other hrHPV genotypes may be present but with less apparent visual response to the application of acetic acid [6].

Colposcopy could be considered a subjective technique with variations in sensitivity depending on the experience of the colposcopist and their ability to correctly direct biopsies [7,8].

HPV vaccination and HPV primary screening will result in early detection of lesions which will be smaller and less noticeable; therefore, future colposcopists may lack exposure to extensive high-grade disease [8,9], which, when considering parity of care, cumulatively, this can amplify the marked disparity in the care women receive from centre-to-centre and even clinician-to-clinician.

Using technology to meet these challenges

Microinvasive disease and smaller lesions are referred to colposcopy due to the increased sensitivity of primary HPV screening, and some of these lesions are challenging to visualise without the aid of adjunct technologies [10,11].
Adjunct technology has proven to help direct biopsies more accurately to the lesion regardless of its size as they reduce the subjectivity, increasing clinician diagnostic confidence and aiding the selection of a biopsy site [7,12]. They also enable colposcopists to undertake see-and-treat excision biopsy when appropriate, avoiding needless preliminary punch biopsies with savings to the patient and health care system.

For dynamic cases, where patients return to colposcopy, further treatment can be avoided only if the biopsy shows no potentially invasive disease and no crypt involvement. In these cases, adjunct technologies could be used to reassure the patient and clinician that the CIN has been fully cleared despite the initial HPV positive screening. In this changing environment where lesions are less likely to be visible, while colposcopist judgement should always prevail,

adjunct technology may be useful for improving diagnostic accuracy, preventing unnecessary invasive treatments, and standardising treatment and care. Comparison of the positive predicted value (PPV), sensitivity and specificity when using colposcopy alone or in combination with adjunct technology, either ZedScan (Electrical Impedance Spectroscopy) or DYSIS (The Dynamic Spectral Imaging System) colposcope with DYSISmap, presented some interesting insights (see Table 1).

Conclusions

It is widely accepted that the diagnostic accuracy of colposcopy needs to be improved and will continue to decline as CIN2 and CIN3 become less prevalent as a result of HPV vaccination and primary HPV screening. In this changing clinical environment, adjunct technologies have proved to not only be a cost-effective method of assessment and reassurance for the patient and colposcopist [13], but can aid patient management, support colposcopist decision making, help to achieve harmonisation, and facilitate more personalised treatment plans, especially for those cases where conservative management is considered. .

References

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