Validity of colposcopy in the diagnosis of early cervical neoplasia: a review

Olaniyan O B

Authors' objectives
To evaluate the accuracy of colposcopic assessment, compared with the reference standard of histology, for the diagnosis of early cervical disease.

Searching
MEDLINE was searched from January 1966 to July 2000 for studies published in the English language; the search terms were not reported. Only 254 articles were identified from the searches. References from retrieved articles were also checked.

Study selection
Study designs of evaluations included in the review
No inclusion criteria relating to the study design were specified. However, the author reported that studies with small numbers of patients (less than 10 in most disease groups) were excluded. The author described all included studies as 'longitudinal studies'.

Specific interventions included in the review
Studies of colposcopy were eligible for inclusion. The colposcopic impression had to be clearly recorded before the biopsy outcome. Studies of unsatisfactory colposcopy were excluded. Studies that reported results using cervical intraepithelial neoplasia (CIN) terminology as human papillomavirus (HPV) infection and CIN I were regarded as 'low grade squamous intraepithelial lesions' (LSIL). Lesions of CIN II and higher grades were grouped as 'high grade squamous intraepithelial lesions' (HSIL).

Reference standard test against which the new test was compared
Studies that used histology of a biopsy sample obtained by directed biopsy were eligible for inclusion. Where the biopsy results indicated a normal or atypical report it was classified as disease absent. All cases of HPV and CIN were classified as disease present.

Participants included in the review
Studies of patients referred for diagnostic procedures rather than screening purposes were eligible for inclusion. Studies of patients receiving the test as a follow-up of previous treatment of cervical disease were excluded, as were studies restricted to a pre-determined cohort of patient, such as human immunodeficiency virus-positive patients, pregnant patients, or only patients with a particular group of abnormal smears. Indications for referral of patients included in the review were atypical cytology, suspect cytology, positive cytology, positive direct visual inspection, or clinical symptoms.

Outcomes assessed in the review
The studies had to provide sufficient data to construct a 2x2 table of test performance to be included in the review. The outcomes reported in the review were overall accuracy, concordance, sensitivity, specificity, positive and negative predictive values, and likelihood ratios. Colposcopic accuracy was defined as the proportion of patients in whom the correlation between colposcopy impression and histological diagnosis was within one histologic degree of neoplasia. Concordance was defined as the proportion of cases in which there was exact agreement between colposcopy and histology.

How were decisions on the relevance of primary studies made?
The author did not state how the papers were selected for the review, or how many reviewers performed the selection.

Assessment of study quality
The author did not state that they assessed validity. However, some quality criteria (patient spectrum, reference standard, review bias) were used to restrict inclusion in the review.

Data extraction
The author did not state how the data were extracted for the review, or how many reviewers performed the data extraction. Data on the numbers of true-positive, false-positive, true-negative and false-negative results were extracted. These were used to calculate the sensitivity, specificity, positive and negative predictive values, likelihood ratios, colposcopic accuracy and concordance.

Methods of synthesis
How were the studies combined?
The accuracy of colposcopy was calculated using two threshold values: the ability to differentiate a normal cervix from an abnormal one, and the ability of colposcopy to recognise a high-grade abnormality versus other grades (i.e. regarding only high-grade abnormalities as 'disease present' and other grades as 'disease absent'). The author reported that a meta-analysis was carried out but did not provide details on how it was done.

How were differences between studies investigated?
The author did not report methods for assessing differences between the studies.

Results of the review
Eight studies (n=6,708) were included.

Disease prevalence ranged from 40 to 89%. The pooled accuracy, as defined by the author, was 89%. Pooled concordance was 61%. The sensitivity for differentiating normal from abnormal cervical tissues ranged from 87 to 99%, and the specificity ranged from 26 to 87%. The sensitivity for differentiating normal and LSIL from HSIL ranged from 24 to 90%, and the specificity ranged from 68 to 97%.

Authors' conclusions
Colposcopy is a valid tool for the diagnosis of early cervical neoplasia. Its integral role in the management of early cervical disease is justified.

CRD commentary
This was a poorly reported and conducted review. The review addressed a clear objective that was supported by well-defined inclusion criteria. However, when reasons for excluding studies were described they did not always match up to these criteria. The literature search was very limited: the review was restricted to studies published in English and only one database was searched. The very small number of hits obtained from this database suggests that the search was limited and, therefore, it is very likely that relevant studies were missed. No details of the review methodology (e.g. the numbers of reviewers involved in the different stages of the review) were reported and a formal quality assessment was not conducted. Some of the outcome measures used were confusing: e.g. 'accuracy' has a standard meaning for test accuracy studies but the authors applied their own different interpretation to this measure.

There were no details of the methods used to pool the studies. Given the extreme heterogeneity between studies some consideration of possible reasons for these differences would have been helpful. It is not possible to state whether the author's conclusions are supported by the data presented, owing to the very limited analysis. The flaws in this review mean that the conclusions and recommendations of the review should be interpreted with extreme caution.

Implications of the review for practice and research
Practice: The author stated that colposcopy is an indispensable tool in the management of premalignant cervical disease, but that its limitations should be borne in mind.
Research: The author stated that randomised controlled trials are needed to provide evidence of best practice.

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