

## The effectiveness of community-based visual screening and utility of adjunctive diagnostic aids in the early detection of oral cancer

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### CRD summary

This review found that there is insufficient evidence to demonstrate the effectiveness of community-based screening for the early detection of oral cancer, or that other adjunctive techniques increase the detection of oral cancer in a community-based screening programme. Although the review methods are poorly reported, the author's conclusions appear suitably cautious.

### Authors' objectives

To determine the effectiveness of community-based visual screening for the detection of oral cancer and pre-cancer, and the efficacy of adjunctive diagnostic aids to assist visual examination. A secondary aim was to determine the effectiveness of mass oral cancer screening programmes employing adjunctive techniques.

### Searching

MEDLINE, EBM Reviews, the Cochrane Controlled Trials Register and DARE were searched from inception to March 2002 for publications in the English language; the search terms were reported. In addition, bibliographic references were also checked for relevant articles. Unpublished material was not included.

### Study selection

#### Study designs of evaluations included in the review

It appears that randomised controlled trials (RCTs), non-randomised controlled trials, cross-sectional studies and prospective studies were eligible for inclusion.

#### Specific interventions included in the review

Studies evaluating community-based visual screening programmes and adjunctive diagnostic aids (tolinium chloride, exfoliative cytology, oral brush biopsy, or oralCDx) were eligible for inclusion. The individuals conducting the examinations included dentists, health workers, oral pathologists, family physicians, nurses and trained volunteers. The diagnostic criteria used in individual included studies were described in the article.

#### Reference standard test against which the new test was compared

No inclusion criteria were specified for the reference standard for community-based oral cancer screening. Where stated, the reference standards used included referral to a dental or medical practitioner for visual confirmation and/or histopathological examination. Histological confirmation was required for lesions identified using adjunctive screening aids.

#### Participants included in the review

The included studies were required to have been conducted in a community-based setting. A variety of sample populations were used; these included industrial workers, individuals with a history of tobacco use, clinic and practice attendees, and hospital patients. The participants were aged from 16 to 60 plus years.

#### Outcomes assessed in the review

The included studies were required to report outcomes for the detection of oral pre-cancer or cancer. The review reported the positive and negative likelihood ratios (LRs). The sensitivity and specificity were calculated.

#### 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 categorised the overall evidence available to answer each of the review questions as either good, fair, poor, or insufficient. The author did not state how the quality of the primary studies was assessed, or how many reviewers performed the quality assessment.

#### Data extraction

The author did not state how the data were extracted for the review, or how many reviewers performed the data extraction.

## **Methods of synthesis**

### **How were the studies combined?**

The studies were combined in a narrative, separately for screening programmes and adjunctive techniques. The positive and negative LR<sub>s</sub>, and sensitivity and specificity were tabulated for individual studies, grouped by screening programme or adjunctive technique assessed.

### **How were differences between studies investigated?**

The author did not report a method for assessing between-study heterogeneity. Differences between the studies (in terms of population prevalence of the target disorder, examination techniques and practitioners, and proportion of the eligible population screened) were discussed in the text.

## **Results of the review**

Twenty-one studies (281,324 participants screened) were included in the analysis on the effectiveness of community-based visual screening for the detection of oral cancer and pre-cancer.

Ten studies (n=4,872) were included in the analysis on the efficacy of adjunctive diagnostic aids to assist visual examination in the diagnosis of oral cancer and pre-cancer.

Community visual screening programmes.

Six studies provided information on the sensitivity of community screening programmes to detect oral cancer or pre-cancer. The sensitivity estimates ranged from 0.71 (specificity 0.99) to 0.94 (specificity 0.98) for screening; a sensitivity estimate of 0.95 for referral was derived from one study. Five studies provided information on the specificity of community screening programmes to detect oral cancer or pre-cancer. The specificity estimates ranged from 0.64 (sensitivity 0.92) to 0.99 (sensitivity 0.71) for screening; a specificity of 0.81 for referral was derived from one study.

Adjunctive techniques.

Toluidine blue, used as either a dye or applied directly to suspicious oral lesions (8 studies): the sensitivity estimates ranged from 0.72 (specificity 0.67) to 1.00 (specificity 0.52), while the specificity estimates ranged from 0.45 (sensitivity 0.86) to 0.93 (sensitivity 0.83 and 0.86).

Visual examination (2 studies): the sensitivity estimates were 0.78 and 0.93, with corresponding specificity estimates of 0.50 and 0.75.

Brush biopsy (1 study): the estimates of sensitivity and specificity were 1.00 and 0.93, respectively.

Lugol's iodine (1 study): the estimates of sensitivity and specificity were 0.88 and 0.84, respectively.

Neural network software (1 study): the estimates of sensitivity and specificity were 0.80 and 0.77, respectively.

Screening augmented by adjunctive techniques. There were insufficient data available to calculate the sensitivity or specificity.

## **Authors' conclusions**

There was insufficient evidence to demonstrate the effectiveness of community-based screening for the early detection of oral cancer. The author added that while there is some evidence to support the use of toluidine blue as an aid to diagnosis, there is insufficient evidence to demonstrate that the use of toluidine blue, or other adjunctive techniques, increases the detection of oral cancer in a community-based screening programme.

## **CRD commentary**

The review addressed a clearly stated research question. The search strategy was restricted by language and, as such, important studies might have been missed. No attempt to identify unpublished material was reported, and publication bias was not assessed. Few details of the review methodology were reported, therefore reviewer error or bias could not be assessed. The author described the quality of the overall evidence available but, since the validity of the individual studies was not reported, the quality of the primary studies is uncertain. Given the heterogeneous nature of the included data (a wide range of index tests and reference standards were assessed), the use of a narrative summary was appropriate. The author's conclusions appear suitably cautious.

## **Implications of the review for practice and research**

**Practice:** The author stated that targeted clinical examination of high-risk individuals may be more effective than mass screening in the early detection of oral cancer.

**Research:** The author stated that additional studies are needed to evaluate the effectiveness of oral cytobrush and toluidine blue as adjunctive aids to oral cancer screening in high-risk community settings.

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This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.