The feasibility of universal screening for primary speech and language delay: findings from a systematic review of the literature

Law J, Boyle J, Harris F, Harkness A, Nye C

Authors' objectives
To examine the feasibility of universal screening for speech and language delay.

Searching
EMBASE, MEDLINE, ERIC, PsycINFO, CINAHL and the Linguistics Language Behavior Abstracts were searched for literature published between 1967 and May 1997. SIGLE and the British Library's Index of Conference Proceedings were searched for unpublished literature. No search terms were reported.

Study selection
Study designs of evaluations included in the review
No inclusion criteria were specified. The review included diagnostic accuracy studies.

Specific interventions included in the review
The review focused on screening procedures which adequately described and explicitly referred to speech and language skills. A range of indices of speech and language delay were tested in the included studies. These included the following; Fluharty Preschool Language Screening Test; Northwestern Syntax Screening Test; revised Denver Developmental Screening Test; Battelle Development Inventory Test; Sentence Repetition Screening Test; Speech and Language Screening Questionnaire; and parent and nurses questionnaires.

Reference standard test against which the new test was compared
A range of speech and language tests were used as the reference standard for studies included in the review.

Participants included in the review
The review aimed to include data on children with primary speech and language delay, which could not be explained in terms of other developmental conditions such as global developmental delays, cerebral palsy and autism.

Outcomes assessed in the review
The sensitivity, specificity, positive predictive value and positive likelihood ratio (PLR) were calculated. Studies in which the screen tests were correlated with the reference test, but for which data to calculate diagnostic indices were unavailable, were excluded from the review.

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

Assessment of study quality
Validity was assessed by means of a quality ranking, using a quality checklist designed by the authors. The items assessed included details of the population, reference and index test, inter-rater reliability and sample size. The authors do not state how the papers were assessed for validity, or how many of the reviewers performed the validity assessment.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.
Methods of synthesis

How were the studies combined?
The data were not formally pooled owing to the heterogeneity of both the interventions and populations. Instead, a descriptive interpretation of the data was presented with studies categorised according to the following groups: studies investigating the same screens that have been applied to more than one population; studies investigating multiple screens that have been applied to the same populations; and studies investigating single screens developed on unaffected and then mixed clinical/unaffected populations.

How were differences between studies investigated?
Differences between the studies were investigated in the narrative.

Results of the review

Forty-five studies were located, providing data on the diagnostic performance of 85 screening tools.

The total number of patients included in the review could not be calculated since not all studies stipulated the number of participants involved.

The Fluharty Preschool Language Screening Test was assessed in three comparisons in three studies. The specificity was comparable across the comparisons (range: 0.85 to 0.97), but the sensitivity varied between the patient groups (range: 0.17 to 0.65).

The Sentence Repetition Screening Test was assessed in four comparisons. The specificity was comparable across the four comparisons, all from one study (range: 0.91 to 0.95), while the sensitivity varied between the patient groups (range: 0.57 to 0.76).

Eight papers dealt with more than one screening procedure on one population. Multiphasic tests were examined in clinical or mixed populations and had PLRs in the range of 1.12 to 3.3. Monophasic tests were examined in unaffected populations and had PLRs in the range of 1.04 and 28.17.

A negative association was seen between the quality of the studies and the PLR (correlation, r = -0.23, p<0.05), sensitivity (r = -0.34, p<0.05) and specificity (r = -48, non significant). The studies with higher quality ratings tended to have higher specificity than sensitivity (t=4.41, p<0.001), but this relationship was not seen in the poorer quality studies.

Authors' conclusions

There was insufficient evidence to warrant the introduction of universal screening at this stage.

CRD commentary

The study addressed a review question which clearly set out the population of interest and the type of study to be included. The authors stated that their aim was to review the feasibility of universal screening for primary speech and language delay. The review, however, has focused on the effectiveness of individual screening tools and has not reviewed information on the effects of a universal screening programme.

The review was supported by a search strategy that involved electronic searches of six databases. The studies were quality assessed but the results of the assessment were not presented in the report of the review. While some details of the studies were given in the text and in accompanying tables, these were not always clear. In addition, one of the categories of studies listed did not have a corresponding results section.

In light of the paucity of high-quality information and the variety of tests used, the authors' conclusion that insufficient evidence is available was justified.

While the review was commissioned by the NHS Centre for Reviews and Dissemination, the review group maintained editorial freedom.
Implications of the review for practice and research
Practice: The authors recommended alternative approaches to early identification of delayed speech and language development.

Research: The authors discuss the type of data that would be required to further address this question.

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