The Japanese guidelines for gastric cancer screening

CRD summary
This review was conducted as part of guideline development for gastric cancer screening in Japan and recommended photofluorography for population-based and opportunistic screening. The review had a number of limitations and the methods were only partially reported in the source article. The authors' conclusions reflected the available data, but the overall evidence supporting the use of gastric cancer screening was weak.

Authors' objectives
To evaluate the efficacy of various methods for gastric cancer screening and to develop a guideline. This abstract summarises the efficacy evaluation component of the article only (not the guideline development process).

Searching
MEDLINE, CINHAL and the Japanese Medical Research Database (Igaku-Cyuo-Zasshi) were searched for articles published from January 1985 to February 2005. No further details of the search strategy were reported. Key journals, including the Journal of Gastroenterological Cancer Screening and the Journal of the Japanese Association for Cancer Detection and Diagnosis, were searched manually. Bibliographies of previous reports on gastric cancer screening were scanned for additional articles.

Study selection
The authors stated that a systematic review of the retrieved articles was conducted using the standardized method (see Other Publications of Related Interest).

Studies that assessed photofluorography, endoscopy, serum pepsinogen testing, or Helicobacter pylori antibody testing for gastric cancer screening, in asymptomatic persons with an average risk, and that were published in full, were eligible for inclusion. Direct evidence was defined as evidence provided by a study that evaluated the efficacy of cancer screening in reducing gastric cancer mortality. Data on diagnostic accuracy and harms related to screening were considered to be indirect evidence.

Based on the criteria described in the standardized method paper, retrieved articles were independently assessed for inclusion by two reviewers and disagreements were discussed at a meeting of the guideline development group.

Assessment of study quality
The standardized method (see Other publications of Related Interest) stated that independent reviewers appraised the quality of each included article using a checklist for each study design (systematic review, RCT, case-control study, cohort study, test accuracy study, ecological and time-series studies and others).

However, no assessment of methodological quality was reported in the article. Levels of evidence were reported.

Data extraction
Data were extracted on odds ratios (OR) or risk ratios (RR) with 95% confidence intervals (CIs) for studies reporting mortality outcomes. Sensitivity, specificity and positive predictive value were extracted from diagnostic accuracy studies. A table summarizing the data on the harms of screening, provided by all included studies, was also presented.

The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
Included studies were summarized in a narrative synthesis.
Results of the review

Ten articles were considered to provide direct evidence and 49 articles were identified as providing indirect evidence.

Photofluorography: Five case-control studies and two cohort studies reported on the effectiveness of screening using photofluorography in reducing gastric cancer mortality. Most of the case-control studies suggested a 40 to 60% decrease in gastric cancer mortality with screening; reported odds ratios ranged from 1.52 (95% CI 0.94 to 2.47) to 0.25 (95% CI 0.12 to 0.51). One of the cohort studies did not show a significant effect for screening; the other cohort study showed significantly decreased mortality in males (RR 0.54, 95% CI 0.41 to 0.70), but no significant effect in females. Seven studies reported diagnostic accuracy based on cancer registry data; the sensitivity of photofluorography ranged from 60 to 80%, and the specificity ranged from 80 to 90%. Based on data from four studies, the five-year survival rate was 74 to 80% for the screened group and 46 to 56% for the non-screened group.

Endoscopy: One cohort study, conducted in an area with a high incidence of gastric cancer in Linqu County, China, evaluated the efficacy of screening using endoscopy to reduce gastric cancer mortality; no significant effect of screening was found. Two studies reported sensitivities of 77.8% and 84% for the detection of gastric cancer. No studies have compared the survival of patients with gastric cancer between screened and non-screened groups.

Serum pepsinogen test: One cohort study reported a reduction in mortality for screening with serum pepsinogen test (RR 0.34, 95% CI 0.07 to 0.98). Eight studies reported on the diagnostic accuracy of serum pepsinogen for gastric cancer; the sensitivities ranged from 40% to 80% and specificity was below 80%.

Helicobacter pylori antibody testing: A follow-up study of patients screened with both Helicobacter pylori antibody testing and serum pepsinogen testing showed significant hazard ratios (HRs) for gastric cancer in patients with both tests positive compared with those with both tests negative (HR 8.2, 95% CI 3.2 to 21.5), and for patients who were serum pepsinogen negative and Helicobacter pylori antibody negative compared with those with both tests negative (HR 6.0, 95% CI 2.4 to 14.5). One study reported that the sensitivity of Helicobacter pylori antibody testing was 87.1% and the specificity was 40.8%.

Harms data were summarized overall, for all studies.

Authors' conclusions

Gastric cancer screening using photofluorography was recommended for population-based and opportunistic screening in Japan.

CRD commentary

This review was conducted as part of a guideline development process and some of the methodology used was reported elsewhere. The research question was clearly stated and defined by appropriate inclusion criteria. A number of sources were searched for relevant studies, but the restriction to published articles meant there was the possibility of publication bias. Based on information reported in the secondary methods publication (see Other Publications of Related Interest), measures to avoid error and bias were applied to the study selection process, but it was unclear whether similar measures were applied to data extraction.

Although the methods publication suggested that an assessment of the methodological quality of included studies should have been undertaken, this was not reported. Details of the included studies were limited, but the use of a narrative synthesis appeared appropriate.

The authors’ conclusions reflected the available data, but the overall evidence supporting the use of gastric cancer screening was weak.

Implications of the review for practice and research

Practice: The authors stated that gastric cancer screening using photofluorography is recommended for population-based and opportunistic screening in Japan. Serum pepsinogen testing and Helicobacter pylori antibody testing may be used to identify individuals at high risk of gastric cancer.
Research: The authors stated that studies to determine the mortality reduction that is associated with endoscopic screening are required. Randomized, controlled trials would be preferred, but would be difficult to conduct in Japan, as screening is already widespread. Further studies on the efficacy of serum pepsinogen *Helicobacter pylori* antibody testing to identify individuals at high risk of gastric cancer are also needed.

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Record Status
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.