Endoscopy for acute nonvariceal upper gastrointestinal tract hemorrhage: is sooner better?
A systematic review
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Authors' objectives
To determine whether early versus delayed endoscopy improves patient and economic outcomes for all risk groups with nonvariceal upper gastrointestinal tract haemorrhage (UGIH).

Searching
English language publications from January 1980 to January 2000 were identified from a structured search of three computerised bibliographic databases (MEDLINE, HealthSTAR, and the Cochrane Database of Systematic Reviews) and a CD-ROM (DDW Abstracts on Disk)-assisted review of published abstracts from three major subspecialty journals. The search, including the selection of the subject headings and keywords, was performed by an expert librarian. The bibliographies of the included studies and key review articles were reviewed for additional references.

Study selection
Study designs of evaluations included in the review
No a priori inclusion criteria relating to the study design appear to have been used. The included studies were randomised controlled trials (RCTs), non-randomised prospective comparative studies, non-controlled prospective studies, interrupted time series, before-and-after studies, and retrospective cohort studies (observational). Where methodology was unclear, authors were contacted for additional information.

Specific interventions included in the review
Early endoscopy (ranging from 1 to 24 hours after initial presentation) versus delayed endoscopy. Studies solely related to nonendoscopic interventions or complications thereof were excluded, as were studies that made no reference to time factors.

Participants included in the review
Studies that included patients with low- or high-risk acute nonvariceal UIGH, or lesions that could cause UIGH, were considered for inclusion. Studies that related solely to variceal bleeding or other complications of portal hypertension were excluded. Studies that looked at occult, subacute, or chronic UIGH were also excluded. The included studies had patients with nonvariceal UIGH, UIGH, peptic ulcers or duodenal ulcers.

Outcomes assessed in the review
The outcomes assessed were mortality, rebleeding, transfusion requirements, the need for emergency surgery, endoscopic complications and readmission.

How were decisions on the relevance of primary studies made?
More than one reviewer independently selected the papers for inclusion, although it was not stated how many of the reviewers were involved in this selection process. Any disagreements were resolved by consensus.

Assessment of study quality
The methodological quality of the RCTs and non-randomised controlled trials was assessed using a standardised instrument. This focused on features related to internal validity, including the use of specific inclusion criteria, appropriate randomisation, concealment of allocation, thorough patient follow-up, full description of drop-outs, and described methods of analysis. Controlled trials were given a quality score ranging from zero to 5, where a score of 3 indicated a poor-quality trial. Quasi-experimental designs, including interrupted time series and controlled before-and-after trials, were assessed for methodological quality using criteria established by the Cochrane Collaboration on effective professional practice (see Other Publications of Related Interest). The authors do not state how the papers were assessed for quality, or how many of the reviewers performed the quality 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.

The data extracted included reference details, patient details, study design, comparison, exclusion criteria, patient outcome measures, and conclusions.

**Methods of synthesis**
**How were the studies combined?**
The studies were combined in a narrative summary.

**How were differences between studies investigated?**
Differences between the studies were discussed in the text.

**Results of the review**
Twenty-three studies (with a minimum of 12,625 patients) were included in the review. There were 4 RCTs, 3 non-randomised prospective comparative studies, 7 non-controlled prospective studies, one interrupted time series, 2 before-and-after studies, and 6 retrospective cohort studies.

The heterogeneity of the study designs, inclusion criteria, timing of endoscopy, and reported end points precluded a formal meta-analysis. The quality score for the controlled trials ranged from 0 to 3 (median: 1).

Inter-rater agreement on the inclusion of studies was high (k=0.07).

Assessment of timing of endoscopy for low-risk patients (20 studies).

There were 13 studies where early endoscopy was an explicit component: 3 RCTs (n=193), one prospective non-randomised study (n=983), 2 before-and-after studies (n=4,049) and 7 uncontrolled studies (n=1,293). There were also 2 experimental studies where early endoscopy was not an explicit component, and 5 observational studies.

It would appear that the weight of the evidence supported early versus delayed endoscopy for low-risk patients with acute nonvariceal UGIH. When only the highest-quality controlled study was considered, the study showed that early endoscopy and prompt discharge of low-risk patients was safe and effective. Of the remaining controlled trials, all showed low complication rates for low-risk participants managed as out-patients. There were no deaths and only nine instances of rebleeding for 594 low-risk outpatients in 7 uncontrolled prospective trials. Of the 20 described studies, 16 suggested that early endoscopy for low-risk patients was safe and effective, 3 were equivocal, and only one detected a statistically-insignificant trend towards increased mortality.

Assessment of timing of endoscopy for high-risk patients (6 studies).

There was one RCT (n=124), 1 prospective non-randomised study (n=100) and 4 retrospective cohort studies (n=5,863).

The weight of the evidence supported early versus delayed endoscopy for high-risk patients with acute nonvariceal UGIH. When only the highest-quality trial was considered, the study showed no mortality benefit but a significant decrease in transfusion requirements with early endoscopy. Of the remaining studies, 2 showed a significant improvement of patient outcomes with early versus delayed endoscopy for high-risk patients, and 2 were equivocal. One study suggested the potential for more complications with emergent nonsedated endoscopy. None of the studies detected any significant impact on mortality for high-risk patients.

Comparison of resource utilisation for patients undergoing early versus delayed endoscopy.

Seven of the 8 studies examining the effect of resource utilisation demonstrated a significant reduction compared with
that of delayed endoscopy. However, most of the included studies were found to suffer from one or more potentially significant methodological shortcomings.

**Cost information**

Data on the outcome measures length of stay and direct costs were collected. The evidence suggested that early endoscopy, compared with delayed endoscopy, significantly reduced the length of stay for all risk groups with nonvariceal UGIH, without any evidence of cost shifting to the out-patient setting. Both of the studies that conducted an absolute cost analysis found a significant saving from early endoscopy. These were not formal cost-effectiveness analyses reporting incremental cost-effectiveness ratios.

**Authors’ conclusions**

The overwhelming majority of existing data suggested that early endoscopy is safe and effective for all risk groups. The clinical and economic outcomes of early endoscopy should be confirmed in additional well-designed RCTs. Given the strength of the evidence, efforts to develop a more standardised and time-sensitive approach to acute nonvariceal UGIH should be undertaken.

**CRD commentary**

This was a fairly well-conducted review. The aims were clearly stated and a fairly comprehensive literature search was undertaken. However, only English language publications were included and no attempt was made to locate unpublished data. A systematic procedure involving one or more reviewers was used to assess the relevancy of the retrieved articles, and the authors assessed the quality of the included trials. It was not stated how many of the reviewers extracted the data. Relevant details of most, but not all, of the included studies were presented in tabular format and described in the text. The actual results (i.e. effect size along with a measure of its variance or significance level) of the individual studies were not presented, only a description of the overall findings. It was also not stated whether significant findings related to statistical or clinical significance. Differences between the included studies were briefly discussed and a narrative synthesis of the results was appropriate.

The authors’ conclusions, which took the poor quality of the included studies into consideration, appear to follow from the results.

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

Practice: The authors did not state any implications for practice.

Research: The authors state that there is a need for studies comparing the costs of 24-hour endoscopy services with ‘usual care’. They also note that the definition of ’early’ needs to be elucidated and confirmed in comparative trials, e.g. is 4 hours better than 12 hours?

**Bibliographic details**


**PubMedID**

11386888

**Original Paper URL**

http://archinte.ama-assn.org

**Other publications of related interest**

Indexing Status
Subject indexing assigned by NLM

MeSH
Endoscopy, Gastrointestinal /economics /methods; Gastrointestinal Hemorrhage /economics /therapy; Humans; Randomized Controlled Trials as Topic; Risk Assessment; Time Factors; Treatment Outcome

AccessionNumber
12001008217

Date bibliographic record published
28/02/2003

Date abstract record published
28/02/2003

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.