Treating achalasia from whalebone to laparoscope

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Authors' objectives
To review the pathophysiology and management of achalasia.

Searching
MEDLINE was searched from 1966 to December 1997 using the search term 'esophageal achalasia' (subheadings: complications, drug therapy, epidemiology, etiology, physiopathology, surgery and therapy). Only studies published in the English language were included.

Study selection
Study designs of evaluations included in the review
Controlled trials or uncontrolled consecutive series involving at least 10 patients observed for a year or longer.

The minimum follow-up period was set at one year. The follow-up periods ranged from 6 to 156 months for controlled trials, while the weighted follow-up ranged from 1.1 to 7.6 years for uncontrolled trials.

Specific interventions included in the review
Botulinum toxin, pneumatic dilation, Heller myotomy thoractomy, laparotomy, laparoscopy, nifedipine and placebo.

Participants included in the review
Participants with achalasia were included. No other details of the participants were given.

Outcomes assessed in the review
For controlled studies, the outcome was the percentage of participants reporting nearly complete symptom resolution. For uncontrolled studies, the outcome was the percentage effectiveness of treatment, defined as the proportion of patients with a good-to-excellent response regardless of the criteria used in the individual studies. The outcomes relating to adverse effects were the risk of perforation (with pneumatic dilation), thoracotomy morbidity, and the number of patients who had repeated treatment.

How were decisions on the relevance of primary studies made?
Abstracts were selected for inclusion by the authors' blinded review of the abstracts. It was not stated how decisions on relevance were made once the selected articles had been retrieved.

Assessment of study quality
The authors do not state that they assessed validity.

Data extraction
Both authors performed the data extraction, but it was not stated if the authors performed this process independently.

In calculating the response rate of each uncontrolled study, the authors extracted the number of individuals with a good-to-excellent response that was sustained until the end of the observation period without any further therapy. If a patient required a second dilation or a second injection, or if a laparoscopic operation was converted to an open procedure, these were considered failures of the initial treatment.

Methods of synthesis
How were the studies combined?
The controlled studies were discussed narratively. For the uncontrolled studies, a pooled estimate of response rate for each therapy was calculated with each study weighted proportionally to its sample size.

How were differences between studies investigated?
The authors do not state how differences between the studies were investigated.

Results of the review

Five controlled studies were included in the review (the total number of participants in the controlled studies was not stated).

Forty-eight uncontrolled studies with a total of 3,549 participants were included in the review. There were 5 studies examining the effectiveness of botulinum toxin (149 participants), 17 of pneumatic dilation (1,276 participants), 13 of Heller myotomy thoracotomy (1,221 participants), 11 of laparotomy (732 participants) and 5 of laparoscopy (171 participants).

Controlled trials (5 studies).

A single controlled trial found that Heller myotomy via thoracotomy was superior to pneumatic dilation after 5 years: 95 and 51% achieved nearly complete symptom resolution, respectively, (p<0.01). In the dilation group, 2 patients (5.4%) sustained perforations and 4 (10.8%) subsequently had a good result with a second dilation. A controlled trial comparing botulinum toxin to pneumatic dilation found a sustained symptomatic response in 32% of botulinum toxin patients at 12 months, compared with 70% of the pneumatic dilation group (p<0.01). A trial comparing pneumatic dilation with nifedipine found a significant decrease in lower oesophageal sphincter pressure, and a significant symptomatic improvement in both groups after 21 months. A placebo-controlled trial found that nifedipine was significantly better than placebo, yielding good to excellent symptomatic response in 70% of achalasia patients after 6 to 18 months. In a prospective controlled trial of botulinum toxin versus placebo (saline injection), botulinum toxin provided significantly better symptomatic, manometric, and radiographic response. However, 7 of the 8 patients relapsed after a mean period of 7 months.

Uncontrolled trials (48 studies).

The weighted mean response for pneumatic dilation was 72% (standard error, SE=26) versus 84% (SE=20) for Heller myotomy and 32% (SE=19) for botulinum toxin. The weighted mean response for laparotomy was 85% (SE=18) versus 92% (SE=18) for laparoscopy. For botulinum toxin, 42% of the patients required repeat treatment; the repeat treatment response was 49% (SE=26). For pneumatic dilation, 21% of the patients required repeat treatment; the repeat treatment response was 80% (SE=42). For patients undertaking laparoscopy, 4.6% required repeat treatment. The repeat treatment rates were not reported for Heller myotomy thoracotomy or laparotomy.

Pneumatic dilation had less morbidity than any surgical procedure (morbidity rates not reported) but it carried a 3% risk of perforation.

Authors' conclusions

Both pneumatic dilation and surgical myotomy were effective therapies for achalasia. Laparoscopic Heller myotomy is emerging as the optimal surgical therapy.

CRD commentary

The review answered a well-defined question.

The literature search was fairly narrow and could have been extended to include other databases, such as EMBASE, and an attempt to identify unpublished material. Publication bias cannot be ruled out. In addition, the search was limited to English language publications, so some important information may be missing. The inclusion criteria were reported, but these were not strictly adhered to; for example, the minimum follow-up period was set to one year, but one study involved some patients who were only followed up for 6 months. Similarly, the minimum number of patients was set at
10, but one study included only 8 patients. The validity of the included studies was not assessed. Details of the primary studies were not given, making the results difficult to interpret. It is unclear how many controlled studies were included in the review, as five were described, yet the abstract stated that six were included. A test for heterogeneity was not performed before the uncontrolled studies were combined. It is likely that heterogeneity was present, as the authors stated that there was no uniformity in the assessment of the trial efficacy.

The authors’ conclusions follow from the results, but should be interpreted bearing the possibility of heterogeneity and publication bias in mind.

**Implications of the review for practice and research**
The authors suggest that it may be time to evolve from pneumatic dilation to the laparoscope.

The implications for future research were not stated, although it would appear that there is a need for more controlled studies in this area.

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