
Special Article

An analysis of review articles published in four anaesthesia journals

Andrew F. Smith BM BS MRCP FRCA

Purpose: To see if the authors of review articles in anaesthesia journals are making use of systematic methods in their preparation.

Methods: Twenty-five review articles published in 1995 in four major anaesthesia journals were analysed and compared with standard guidelines for the appraisal of reviews.

Results: Of the 25 articles, only 14 stated a clear purpose. Only two revealed the search strategy used to identify articles for the review. None of the reviews featured any type of quality assessment of the primary studies included, or stated what criteria, if any, were used to determine what material was included or excluded. Useful areas for future research were highlighted in only seven reviews.

Conclusion: There is little evidence that reviews currently accepted for publication in anaesthesia journals have been prepared systematically.

Objectif : Vérifier si les auteurs de revues générales publiées dans les journaux d'anesthésie systématisaient la préparation de leurs articles.

Méthodes : Vingt-cinq revues générales publiées dans quatre journaux d'anesthésie importants ont été analysées et comparées aux directives standards pour ce genre de travail.

Résultats : De ces 25 articles, seulement 14 énonçaient un objectif précis. Seulement deux révélaient la stratégie de recherche utilisée pour la sélection des articles utilisés. Aucune des revues n'évaluait la qualité des articles originaux utilisés, ni ne mentionnait les critères d'inclusion ou d'exclusion du matériel utilisé. Sept des revues seulement suggéraient des sujets valables pour une recherche ultérieure.

Conclusion : Il est loin d'être évident que les revues générales acceptées pour publications dans les journaux d'anesthésie ont été préparés de façon systématique.

From the Department of Anaesthesia, Manchester Royal Infirmary, Oxford Road, Manchester, United Kingdom M13 9WL.
Phone: (0161) 291-3772; Fax: (0161) 291-4132.

Address correspondence to: Dr. Andrew F. Smith, University Hospital of South Manchester, Nell Lane, Manchester, UK M20 8LR.
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KEEPING up to date with medical research is time-consuming. Busy clinicians need to develop strategies for refreshing their knowledge and skills most efficiently.¹ Review articles are popular for this² as a collation and summary of a much larger body of primary research. In original research, investigators are well accustomed to setting out protocols before work starts, defining inclusion and exclusion criteria, and using randomisation and blinding to ensure valid results. Such techniques to minimise the effects of bias and the play of chance are used much less readily in the preparation of reviews, although there is published guidance on the recommended methods.³⁻⁵ Whether the review has been prepared by someone well known in the field or by someone more junior, there is a risk that the finished product may be arbitrary, selective and subjective. Systematic reviews are a way of increasing the reliability of the conclusions and hence their clinical usefulness. Although it is nearly a decade since reviews in general medical journals were scrutinised,⁶ these techniques have not been applied to the anaesthetic literature.

Methods

The 1995 issues of four internationally regarded anaesthesia journals (*British Journal of Anaesthesia*, *Anesthesia and Analgesia*, *Anesthesiology* and the *Canadian Journal of Anaesthesia*) were searched for articles which could be classed as literature reviews. Suitable articles appeared under various titles, including 'special article' and 'medical intelligence article.' Some articles, though presented as reviews, were excluded because they were a summary of clinical experience¹⁸ or were conducted as audit.¹⁹

To see how reviewers located, selected, appraised and assimilated the literature for their articles, I compared them with a standard simple methodological checklist (Table I) based on published guidelines and previous work.^{6,7} Paired articles^{31,32} were treated as one. The number of meta-analyses and systematic reviews published in each journal were also noted.

TABLE I Assessment criteria for review articles

1. Was the purpose of the review specified?
2. Were the search methods used to locate relevant studies comprehensive?
3. Were explicit criteria used to decide which articles to include in the review?
4. Was the methodological quality of the primary studies assessed?
5. How were the results of the primary studies combined?
6. Were suggestions made for future research?

Results

The results of the survey are summarised in Tables II and III.

Was the purpose of the review specified?

The authors of 11 reviews either did not specify a purpose, or stated simply that they intended to 'review the literature' on their chosen subject. No title was phrased as a question, though one review²⁹ opened with the question the author proposed to answer. Some aimed to be comprehensive; Morgan¹⁷ wanted to '... review the history, effects, technique, indications, contra-indications and complications of this method of anaesthesia as it applies to the obstetrical patient.' Jensen and colleagues²³ were prompted to rectify deficiencies in the scope of an earlier review of the same topic.

Were the search methods used to locate relevant studies comprehensive?

This was hard to assess, as only two reviewers specified any searching strategy. Both of these used a Medline search, although no time limits were detailed; one¹⁵ then went on to examine the bibliographies of articles identified by Medline but limited the search to material in English. The other¹⁶ also examined annual meeting supplements of the journals *British Journal of Anaesthesia*, *Anesthesia and Analgesia*, *Anesthesiology* and the *Canadian Journal of Anaesthesia*.

Were explicit criteria used to decide which articles to include in the review?

Was the methodological quality of the primary studies assessed?

How were the results of the primary studies combined?

There was no documentation in any of these reviews that any of these processes had been considered.

Were suggestions made for future research? Six reviews ended with attempts to direct intending researchers to gaps in knowledge in the fields they had covered. The others merely concluded with a variant on the line '... further studies are needed ...' or ignored future directions altogether.

TABLE II Summary of results

Number of reviews analysed	25
Purpose of review stated	14
Search strategy stated	2
Inclusion criteria given	0
Quality assessment performed	0
Future research directions suggested	7
Number of meta-analyses/systematic reviews	4

TABLE III Results by journal

	<i>Anesthesia and Analgesia</i>	<i>Anesthesiology</i>	<i>British Journal of Anaesthesia</i>	<i>Canadian Journal of Anaesthesia</i>
Number of reviews analysed	10	2	10	3
Purpose of review stated	8	1	4	1
Search strategy stated	0	0	0	2
Inclusion criteria given	0	0	0	1
Quality assessment performed	0	0	0	0
Future research directions suggested	4	1	1	1
Number of meta-analyses/ systematic reviews	1	1	1	1

Discussion

In recent years, much attention has been paid to improving the methodological quality of primary research in anaesthesia. Central to this process have been editorial policy and peer review on the part of the anaesthesia journals. Research workers, therefore, have the incentive to keep standards high to increase their chances of publication. It is important that reviews are as valid as possible; they must therefore be based on sound evidence. Unfortunately, as this survey demonstrates, it is simply not possible to make any assessment of the validity and clinical applicability of currently published reviews as the processes involved are unknown. Oxman states: 'The most dangerous errors in reviews are systematic ones (bias) rather than ones that occur by chance alone (random errors).'⁷ This is not to say that reviewers intend to mislead their readers and I do not wish to suggest this. However, reports of primary research studies set out the methods used, the patients studied, the setting and the statistical techniques used to analyse the resultant data. This openness allows readers to test the validity and applicability of the findings to their own practice, and exposes weaknesses in method that may undermine the results.

The benefits of applying the same systematic techniques to reviews have been discussed recently by Mulrow.⁸ Traditional reviews are prone to bias throughout the review process. Suitable material for inclusion in the review may be missed because of inadequate searching techniques; some relevant material may never have been published. Publication bias comes from a number of sources.⁹ Most simply, researchers are more likely to submit, and hence editors are more likely to publish, trials with a positive result. Shortcomings in the peer review process may also influence what is published. It has been shown that referees are more likely to favour work agreeing with their own opinions;¹⁰ bias may also result from conflicts of interest over funding, or professional com-

petition.¹¹ Review articles have usually been commissioned from an acknowledged expert in the field. Oxman and Guyatt¹² have found that the quality of a review, as judged by criteria similar to those above, varies inversely with the expertise of the writer. They suggested that this might be related to the strengths of experts' previous opinions, the amount of time spent on the preparation of the article, and personal antagonism to other workers in the field.

Systematic reviews are efficient scientifically. It takes time and effort to prepare one, but it takes much longer and is more arduous again to embark on a new study. Furthermore, a comprehensive search will not need to be repeated when the review is brought up to date. Systematic reviews make it easier for intending researchers to select hypotheses, avoid pitfalls and select sample sizes. They also allow the generalisability of findings and the consistency of effects and relationships to be tested.

One major advantage lies in using quantitative or meta-analytic techniques to summarise research findings statistically. The results of small studies can be pooled to give greater power and more reliable conclusions; this method was applied to trials evaluating the effect of a small dose of corticosteroids in women expected to give birth prematurely.¹³ A combined effect size indicated a sharp reduction in infant morbidity and mortality when steroids were used, which had not been apparent from the individual trials. Also, cumulative meta-analysis, by adding to established material as new work appears, allows decisive evidence of harm or benefit to be recognised earlier. Had this approach been applied to the trials examining thrombolytic therapy with streptokinase after myocardial infarction, the beneficial effects of the treatment would have become clear some years before the drug actually came into widespread clinical use.¹⁴

Methods for making reviews more systematic are detailed elsewhere.^{3,4} The initial literature search may

be made more comprehensive by starting with a computerised bibliographic database such as Medline, then searching the reference lists of identified studies; hand-searching journals in which relevant material tends to appear may yield more. Unpublished data can be harder to find, and here conference abstracts and direct contact with experts in the field are useful. This will increase the work involved, and one might think that this would tend to obscure salient findings. However, the number of papers and reports included in the analysis is likely to be smaller because some work may be rejected due to poor methodological quality. Furthermore, by limiting the focus of the review, the reviewer can afford to be more exhaustive in initial searching. Many tightly-directed reviews pose a simple question – for instance, ‘Do non-steroidal anti-inflammatory agents lead to greater perioperative blood loss in tonsillectomy in adults?’ (This contrasts with the broad, all-inclusive approach of Morgan quoted above¹⁷). Practising clinicians often find themselves asking specific questions arising from the care of their patients. Often, the answers are buried somewhere in the text of a more comprehensive review; might it not be better to start with the question and direct the review towards answering it? Further, since intending researchers often conduct a literature review as the first step in examining a particular topic, it is striking that so few of the articles attempt to highlight the underexplored aspects of the field they have surveyed. Surely it is as important to try to identify gaps in our knowledge than to re-state what we already know?

It seems strange that all four journals published systematic reviews or meta-analyses as well as the traditional review article.^{20,22,43,44} These appeared in the ‘Clinical Investigations’ section (or equivalent) of the journal; why these are treated differently is not clear. It might be that they are not perceived as serving the same purpose; it might also be that the more mathematical style of the meta-analysis is unfamiliar to readers and unpopular with writers of mainstream reviews. Nevertheless, the co-existence of the two forms, sometimes in the same issue, is noteworthy, and shows that systematic methods are not completely unknown within anaesthesia.

Conclusion

Reviews published in the anaesthetic journals surveyed are unsystematic and cannot be assumed to be free of bias. This study has I hope raised a number of questions about how the anaesthetic literature can best be made manageable and used to improve our patients’ care.

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