Anticoagulation in spinal surgery: a critical review of the literature

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Authors' objectives
To critically appraise the existing literature regarding thromboprophylaxis in elective spinal surgery.

Searching
MEDLINE was searched from 1965 to 1995 using the keywords 'anticoagulation', 'DVT' and 'spine', alone and in different combinations. In addition, seven journal titles were handsearched for additional studies.

Study selection
Study designs of evaluations included in the review
Any study on elective spinal surgery that dealt with DVT, PE and thromboprophylaxis was included.

Specific interventions included in the review
The method of prophylaxis was not reported in all of the studies. The methods reported were: compression stockings, sequential compression stockings, pneumatic compression stockings, thigh-high antithromboembolic compression stockings, graduated compression stockings, and low-dose coumarin.

Participants included in the review
Patients undergoing elective spinal surgery.

Outcomes assessed in the review
Thromboembolic (TE) complication rates associated with spinal surgery were assessed. These were defined as the deep venous thrombosis (DVT) rate and the pulmonary embolism (PE) rate. The method of surveillance was not reported in all studies, but included radionuclide phlebography, ascending phlebography, and duplex and doppler ultrasonography.

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

Assessment of study quality
The author does not report the method used to assess validity, or how the validity assessment was performed.

Data extraction
A single observer extracted the data.

Methods of synthesis
How were the studies combined?
A narrative synthesis was undertaken with no formal pooling, although a raw average of TE complications was calculated from the studies.

How were differences between studies investigated?
The author discussed differences in the study design and the robustness of the results.

Results of the review
Fifteen studies were included (346 TE cases out of a total of 11,912 participants). One was a small randomised study
with a moderate to high risk of error (1 TE case out of 329 participants); 1 was a non-randomised study with contemporaneous controls (1 TE case out of 84 participants); 5 studies (12 TE cases out of 916 participants) were non-randomised historically-controlled studies; and 8 (332 TE cases out of 10,583 participants) were case series with no controls.

From the included studies, the natural incidence of TE complications in spinal surgery was unknown. All of the studies had methodological flaws, which meant that the true incidence of DVT and PE were likely to be underestimated. The raw average of TE complications calculated from the studies was 7.1% (standard deviation 14.1). However, this figure is not reliable because of the poor quality of the studies.

Authors' conclusions
The true incidence of TE complication in spinal surgery could not be determined from the current literature. The risk factors for TE complications are also unknown and it is not known whether prophylaxis to prevent DVT and PE is safe, clinically effective and cost-effective.

CRD commentary
The narrative review provided a detailed discussion of the included studies.

The search was restricted to MEDLINE, no dates were given for the handsearching, and it was unclear whether non-English language articles were considered. These restrictions, and the lack of searching for unpublished articles, mean that relevant studies may have been missed.

Details of the methodology of the review were not given, and there were no details of how the validity of the included studies was assessed. The author discussed the limitations of the studies in the narrative of the review. The calculation of a raw average complication rate is very questionable, as the author highlighted, due to the diverse nature and poor quality of the included studies.

There was insufficient detail regarding the participants of the primary studies to assess the generalisability of the results. The author's conclusions follow from the results presented.

Implications of the review for practice and research
Practice: The author states that recommendations for thromboprophylaxis cannot be made from the findings of these studies because of the lack of good scientific evidence.

Research: The author states that there is a need for a well-designed randomised, double-blind, placebo-controlled study of anticoagulation in spinal surgery.

Bibliographic details

Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Adult; Anticoagulants /therapeutic use; Child; Clinical Trials as Topic; Incidence; Postoperative Complications /epidemiology /prevention & control; Research Design; Risk Factors; Spine /surgery; Elective Surgical Procedures; Thromboembolism /epidemiology /prevention & control

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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.