Title: Anticoagulation for patients with cancer and central venous catheters: a systematic review and meta-analysis

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Keywords: Anticoagulation, cancer, central vein catheter

Descriptive statement using simple terms to be accessible to audience from diverse scientific backgrounds: This systematic review evaluates the efficacy and safety of blood thinning agents in patients with cancer and central venous catheters

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Funding source: National Institute for Health Research, UK

ABSTRACT

Background
Central venous catheter (CVC) placement increases the risk of thrombosis in cancer patients. Thrombosis often necessitates the removal of the CVC, resulting in treatment delays and thrombosis related morbidity and mortality.

Objectives
To evaluate the efficacy and safety of anticoagulation in cancer patients with a CVC.

Search Methods
A comprehensive search was performed for studies of anticoagulation in cancer patients including a February 2013 electronic search of: the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE and ISI Web of Science. We hand-searched conference proceedings, checked references of included studies, used the "related article" feature within PubMed, and checked clinical trials.gov for ongoing studies.

Main results
Of 9,560 identified citations, we included 12 RCTs (19 reports) enrolling 4,089 patients and assessing either prophylactic dose heparin or low dose VKAs. Parenteral anticoagulation was not associated with a statistically significant effect on death (RR 0.85; 95% CI 0.55 to 1.31) or major bleeding (RR 0.68; 95% CI 0.1 to 4.78) but there was high quality evidence of reduction in VTE (RR 0.54; 95% CI 0.35 to 0.85). Low dose VKAs were not associated with a statistically significant effect on death (RR 0.97; 95% CI 0.82 to 1.15) or major bleeding (RR 6.93; 95% CI 0.86 to 56.08), but there was moderate quality evidence of reduction in VTE (RR 0.51; 95% CI 0.29 to 0.89).

Conclusions
In this systematic review, our updated meta-analysis of data from twelve trials and 4,089 participants revealed high quality and moderate quality evidence of reduction in VTE with the use of LMWH and VKA, respectively. There was no statistically significant effect on other outcomes of interest for heparin or VKA. However, the findings did not rule out clinically important benefits and harms. Patients with cancer with CVCs considering anticoagulation should balance the possible benefit of reduced thromboembolic complications with the possible harms and burden of anticoagulants. The main limitation of this systematic review is the inclusion of different types and stages of cancer.