

Which are best – thigh length or knee length anti-embolism stockings: a systematic review of efficacy and patient preference

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Introduction

Surgical patients are at an increased risk of developing deep vein thrombosis (DVT). Routine prophylaxis reduces morbidity, mortality and health service costs in patients at risk. Prophylaxis can be pharmacological (such as low molecular weight heparin) and/or mechanical (such as anti-embolism stockings [also known as graduated compression stockings]).

Graduated compression stockings are available as knee length or thigh length. The NICE guideline 'Venous thromboembolism: reducing the risk' states that the length of stockings is a controversial issue and there is no clear randomised evidence that one length is more effective than another.

Objective

Our objective was to investigate the available evidence in order to assess whether further research on optimal stocking length might be warranted and worthwhile.

Methods

We conducted a systematic review to assess the clinical effectiveness of knee length versus thigh length graduated compression stockings for the prevention of DVT in surgical patients, together with a review of studies of patient adherence and patient preference.

Previous systematic reviews and electronic databases were searched for randomised controlled trials (RCTs) of thigh length or knee length compression stockings in surgical patients. Study quality was assessed using the Cochrane Risk of Bias Tool.

The primary outcome was incidence of DVT. Complications associated with DVT and adverse events related to the use of compression stockings were also assessed. Meta-analysis (random-effects model) of the DVT data was performed and the I^2 statistic was used to quantify statistical heterogeneity. In addition, to draw on a wider evidence base, a network meta-analysis was undertaken. Data on secondary outcomes were tabulated and synthesised narratively.

The review of patient adherence and patient preference included trials and observational studies; data were tabulated and synthesised narratively.

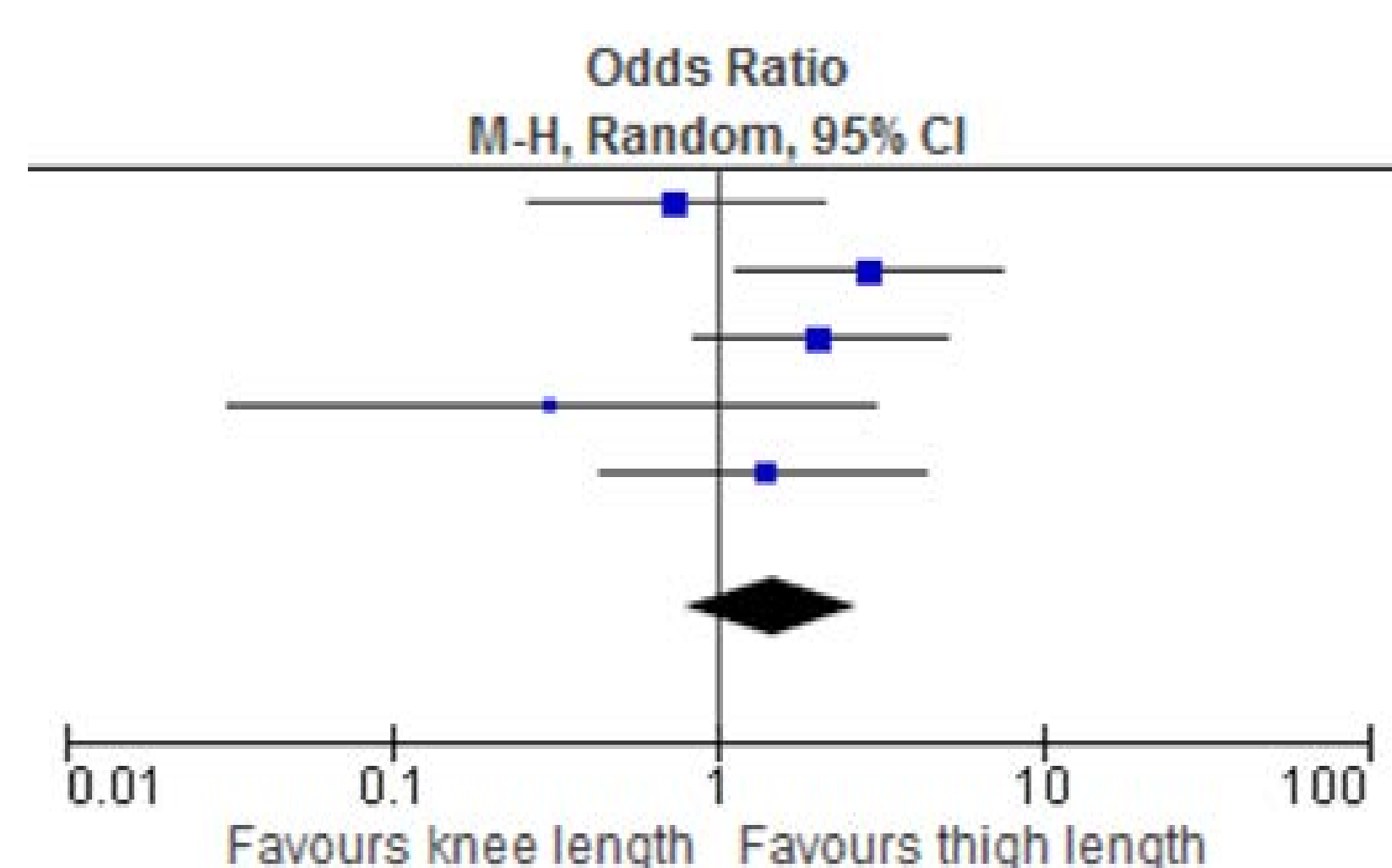
Results

Effectiveness of thigh length versus knee length stockings

DVT results

Twenty three RCTs were included in the systematic review. There was substantial variation between the included trials in terms of the patient characteristics, interventions and methods of outcome assessment. Validity assessment suggested that most had an unclear or high risk of bias. Where reported, the majority of DVTs were asymptomatic, the clinical consequences of which are unknown.

Five trials comparing knee length versus thigh length stockings with or without pharmacological prophylaxis were pooled; the summary estimate of effect indicated a trend favouring thigh length stockings, but the findings were not statistically significant (OR 1.48, 95% CI 0.80 to 2.73; $I^2=33\%$).



Network meta-analysis

Thirteen trials contained data that directly or indirectly informed the relative effectiveness of thigh length versus knee length stockings, with or without pharmacological prophylaxis, for the prevention of DVT and were included in the network meta-analysis.

There was significant statistical heterogeneity in the models and inconsistency indicating that there may be underlying unknown clinical and methodological heterogeneity across the trials.

In the base case analysis, thigh length stockings with pharmacological prophylaxis were more effective than knee length stockings with pharmacological prophylaxis (knee vs thigh OR 1.76, 95% CrI 0.82 to 3.53), but this result was not statistically significant.

Overall, thigh length stockings with pharmacological prophylaxis was the most effective treatment with a 73% probability that it would be the most effective treatment in a new trial of all the treatments.

Pulmonary embolism, mortality and adverse event results

Pulmonary embolism events and venous thromboembolism-related deaths were generally rare in the included trials. Adverse events were rarely reported, and those related to compression stockings were minor events, including minor foot abrasions, superficial thrombophlebitis, or the stocking slipping down.

Patient adherence and preference

Nine RCTs and seven observational studies reported data on patient adherence (wearing stockings correctly) and/or preference.

Patient adherence was generally higher with knee length stockings than thigh length stockings. However, the studies only reflected patient adherence in a hospital setting; it is likely that adherence would be lower after patients have been discharged from hospital.

Patients preferred knee length stockings over thigh length stockings.

Conclusions

Thigh length stockings may be more effective than knee length stockings at preventing DVT in surgical patients. However, patients are more likely to wear knee length stockings correctly. Incorrectly worn stockings can be unsafe.

A large trial comparing thigh length versus knee length stockings could provide a definitive answer to this question; however, the cost of undertaking a trial would be high and it is not clear that it would be worthwhile. The value of further research is highest in patients at a high risk of DVT, although the use of new oral anticoagulant treatments that lower the risk of DVT will lower the value of such a trial.

Therefore, a more pragmatic approach may be to give thigh length stockings only to patients who can use them properly, whilst knee length stockings are more appropriate for patients who are less physically adept.

References

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