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Review: Graduated compression stockings reduce deep venous thrombosis in hospitalized patients

Sara Vazquez, PharmD and Matthew T. Rondina, MD
University of Utah, Salt Lake City, Utah, USA

Question

In patients hospitalized for conditions other than stroke, do graduated compression stockings (GCSs) prevent deep venous thrombosis (DVT)?

Review scope

Included studies compared GCSs with no GCSs, with or without a background of another prophylaxis method, in patients hospitalized for conditions other than stroke. Outcomes included DVT and pulmonary embolism (PE).

Review methods

Cochrane Peripheral Vascular Diseases Group Specialised Register (Jan 2010), Cochrane Central Register of Controlled Trials (Issue 4, 2009), and reference lists were searched for randomized controlled trials (RCTs). 18 RCTs (1463 patients, 2527 units of analysis) met the selection criteria. 6 trials randomized legs, such that each patient had 1 leg treated with GCSs and 1 control leg; in these studies, legs were the unit of analysis. 17 trials included surgery patients (52% of patients had general surgery). GCSs were applied the day before or the day of surgery and worn for 14 days or until discharge or full mobility. 17 trials used thigh-length GCSs; 1 trial included both thigh- and knee-length GCSs. In the 10 trials with a background of another prophylactic method, patients received Dextran 70 (3 trials), subcutaneous heparin (3 trials), aspirin (2 trials), low-molecular-weight heparin (1 trial), or sequential compression (1 trial). 8 studies described adequate randomization sequence generation, and 5 described adequate allocation concealment.

Main results

Meta-analysis showed that GCSs reduced risk for DVT, both with and without a background of another prophylaxis method (Table). Trials had low power for detecting the effects for PE.

Conclusion

In patients hospitalized for conditions other than stroke, graduated compression stockings reduce risk for deep venous thrombosis.

Commentary

Current guidelines recommend using mechanical methods of venous thromboembolism (VTE) prophylaxis primarily in at-risk, hospitalized patients with a high risk for bleeding or in addition to pharmacologic-based prophylaxis (1). In the systematic review by Sachdeva and colleagues, most trials used thigh-length GCSs, and 9 also used pharmacologic agents for VTE prophylaxis. Use of GCSs reduced risk for DVT but not PE, and the reduction was more pronounced for GCSs plus pharmacologic prophylaxis than in the absence of background prophylaxis.

Although the findings of this rigorous review support the use of GCSs for DVT prevention, methodological limitations of the individual trials reduce the overall quality of the pooled evidence. None of the individual studies was clinician-blinded, introducing the possibility of ascertainment bias. All but 1 of the studies were done in surgical populations, and thus it is unclear whether the results can be extrapolated to medically ill patients. Most studies in the meta-analysis used the fibrinogen uptake test to screen for DVT. This is problematic because that test is known to be associated with a high rate of false-positive results and has not been used as an endpoint in clinical trials for many years.

These data indicate that GCSs reduce the risk for VTE in surgical patients. Nevertheless, given the higher-quality and more voluminous data establishing the efficacy of pharmacologic-based VTE prophylaxis (1), GCSs as a stand-alone prevention strategy should probably be reserved for patients for whom bleeding risk associated with pharmacologic strategies is believed to outweigh the potential benefits.

Acknowledgments

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References

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Table

Graduated compression stockings (GCSs) vs control in patients hospitalized for conditions other than stroke*

Outcomes	Comparison	Number of trials (<i>n</i> [†])	Weighted event rates		RRR (95% CI)	NNT (CI)
			GCS	Control		
Deep venous thrombosis	No background prophylaxis	8 (1279)	12%	26%	54% (42 to 63)	8 (6 to 10)
	Background prophylaxis	10 (1248)	4%	16%	72% (59 to 81)	9 (7 to 13)
Pulmonary embolism	No background prophylaxis	1 (95)	0%	2%	67% (−682 to 99)	Not significant
	Background prophylaxis	3 (254)	3%	9%	63% (−7 to 87)	Not significant

* Abbreviations defined in Glossary. RRR, NNT, and CI calculated from risk ratios and risk differences in article.

[†] *n* = unit of analysis (patient or individual leg).