



Catheter-directed Thrombolysis versus Anticoagulation for the Prevention of Post-thrombotic Syndrome in lower extremity Deep Vein Thrombosis : A Systematic Review and Meta-analysis

Ashkan Heshmatzadeh Behzadi M.D. , Behzad Amoozgar M.D., Martin Prince M.D. PhD, Igor Latich M.D., Noel Velasco M.D. , Hamid Mojibian M.D.
Yale Newhaven , CT, USA . Contact info : Ashkan.hbehzadi@gmail.com , Phone:347-443-4407

Background

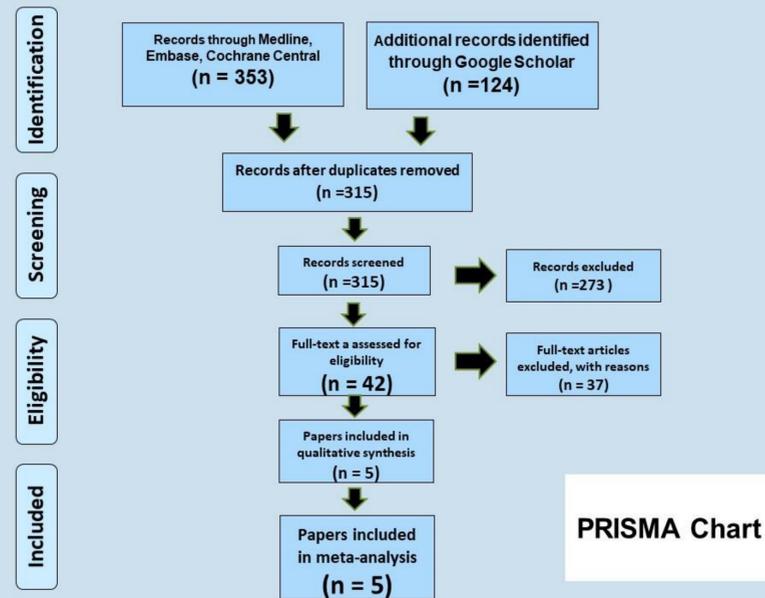
- Post-thrombotic syndrome (PTS) is a complication of deep vein thrombosis (DVT) occurring in 40% to 60% of affected patients.
- The clinical manifestations of PTS include a constellation of symptoms and signs, the severity ranges from minimal discomfort to severe clinical manifestations such as chronic pain, intractable edema, and leg ulceration.
- It has serious negative implications for the quality of life and contributes to rising healthcare costs.
- Recent randomized trials comparing additional catheter-directed thrombolysis to standard treatment showed conflicting outcomes.

Objective

- We performed a Systematic review and meta-analysis to assess the benefit of additional catheter-directed thrombolysis for the prevention of post-thrombotic syndrome compared additional to standard therapy (anticoagulation therapy) in patients with lower extremities deep-vein thrombosis.

Materials and Methods

- This meta-analysis was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA).
- Databases: Medline, Embase and Cochrane Central and Google scholar was searched from the time frame of database inception until March 30, 2021.
- Outcomes of interest included short term (≤ 12 months) and long term post-thrombotic syndrome based (24 \leq months), Iliofemoral patency, mortality, and bleeding risk, death.



5 papers met inclusion and exclusion criteria

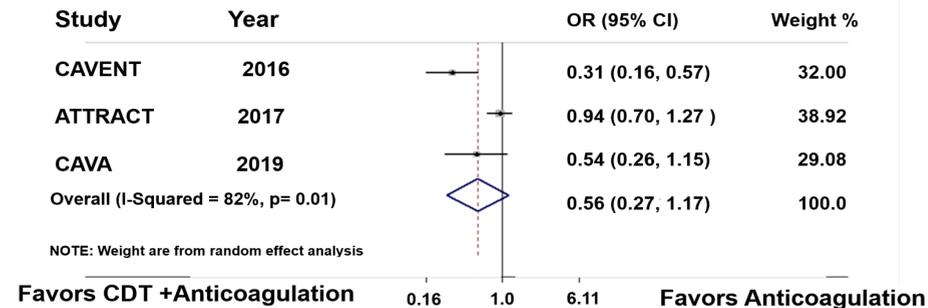
Study/Year	Device	Thrombolytic Agent	Anticoagulation Regimen	Patient in CDT+ AC Vs AC	Follow Up (months)
CaVenT (2009)	Not reported	Alteplase	UFH; LMWH; warfarin	50;53	6
CaVenT (2016)	"UniFuse;	Alteplase	UFH; LMWH; warfarin	87;89	60
ATTRACT (2017)	Covidien/Angiojet Rheolytic Thrombectomy System;	Alteplase	UFH; LMWH; warfarin	336;355	24
CAVA (2020)	"Ekos Endowavesy stem	Urokinase	Vitamin K antagonists, LMWH; warfarin	77;75	12
CAVA 2 (2021)	"Ekos Endowavesy stem	Urokinase	Vitamin K antagonists, LMWH; warfarin	62;58	39

The total number of cases included in the final dataset was 1019 , with 500 undergoing CDT plus anticoagulation vs. 519 patients treated with anticoagulation only.

CaVenT: catheter-directed venous thrombolysis; ATTRACT: acute venous thrombosis: thrombus removal with adjunctive catheter-directed thrombolysis; EKOS: Ekosonic endovascular system; CDT: catheter-directed thrombolysis; AC: anticoagulation; UFH: unfractionated heparin; LMWH: low molecular weight heparin.

Results

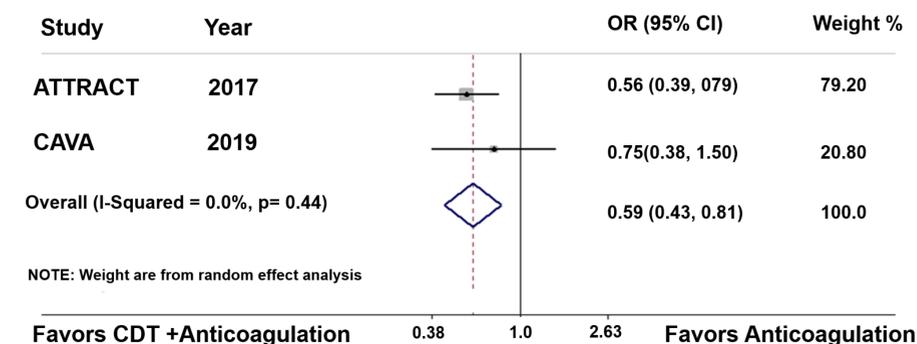
Long-term Post-thrombotic syndrome



Long-term PTS

Additional CDT does not change the risk of long term post-thrombotic syndrome. (OR: 0.56; 95% CI: 0.27–1.2 (P= 0.44); I-squared (81.7%).

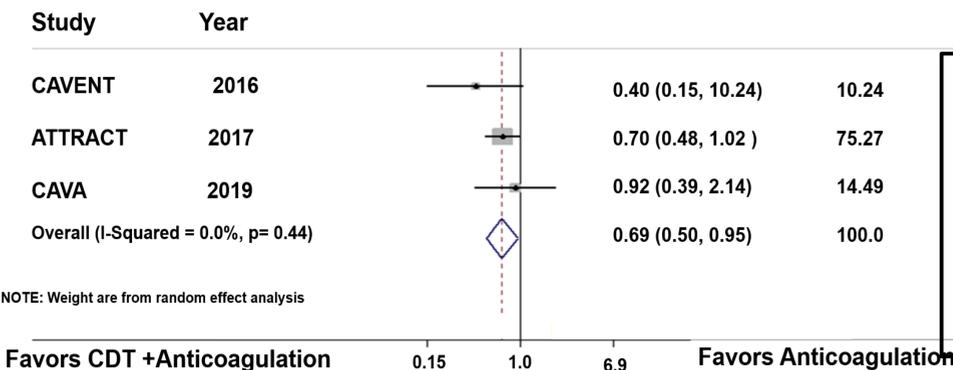
Short Term Post-thrombotic syndrome



Short-term effect

Additional CDT was more likely to decreased rates of short-term PTS (OR: 0.59; 95% CI: 0.43–0.81(p= 0.001); I-squared (81.7%).

Moderate to Severe Post-thrombotic syndrome



Moderate to severe PTS

Additional CDT was associated with decreased rates of moderate to severe PTS (OR: 0.68; 95% CI: 0.5–0.95(P=0.02); I-squared (0.0%) .

Bleeding : The two groups of patients did not have a statistically significant difference on major bleeding (OR: 1.06; 95% CI: 0.67–3.8; I-squared (10.0%).

Conclusion

- showed that additional CDT does not change the long-term risk of post-thrombotic syndrome
- CDT decrease short term , moderate to severe post-thrombotic syndrome rates and improve iliofemoral vein patency compared to anticoagulation therapy alone.
- Decision to utilize CDT to prevent PTS should be individualized according to patient risk factors for developing PTS and their risk of bleeding.

Limitations

- Different devices were used among the included trials.
- The anticoagulation regimens were not exactly the same.
- The included studies did not provide sub-analysis for location (iliofemoral vs. femoropopliteal segments).
- The follow-up duration of the included trials varied.
- All these limitations, potentially led to the high heterogeneity found in our analysis.

References

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