

Preface

Recent Advances in Thrombosis and Hemostasis—Part VIII

Sam Schulman, MD, PhD^{1,2}¹Department of Medicine, Thrombosis and Atherosclerosis Research Institute, McMaster University, Hamilton, Ontario, Canada²Department of Obstetrics and Gynecology, The First I.M. Sechenov Moscow State Medical University, Moscow, Russia

Semin Thromb Hemost 2022;48:405–406.

Everybody, sooner or later, sits down to a banquet of consequences.

Robert Louis Stevenson, 1850–1894

Venous thromboembolism (VTE) is typically considered an acute disease that requires prompt treatment with anticoagulants. This therapy has in multiple trials proved to be effective for prevention of progression of the thrombus and further embolization. However, there are also well-described sequelae. Those include the postthrombotic syndrome, seen in 20 to 50% of patients with previous deep vein thrombosis (DVT),¹ pulmonary hypertension, that only occurs in 4 to 5% of patients with pulmonary embolism (PE) but can be fatal,² and the post-PE syndrome, which manifests with persistent dyspnea, exercise limitation, and reduced quality of life persisting for > 3 months despite prior effective anticoagulation for the PE.³ The post-PE syndrome was diagnosed during follow-up in one-third of the patients included in the Pulmonary Embolism Thrombolysis (PEITHO) trial.⁴

This 8th theme issue of the series of Recent Advances in Thrombosis and Hemostasis includes several review articles that address other possible consequences—or perhaps just associations—with VTE, such as major adverse cardiovascular events and major adverse limb events, cardiovascular death, and reduced quality of life. The reader will also find a continuation of the miniseries on VTE in the pediatric population from the 7th theme issue.⁵

We will, however, start logically with the concept of preventing VTE from occurring. In the first article, Krauss et al evaluated a modified version of the Caprini Risk Score, by using scores of 10 or more (instead of the original 5), to stratify the prophylactic regimen against VTE in patients with elective hip arthroplasty.⁶ They reasoned that patient populations can vary in their risk profile, and therefore “high risk” is not necessarily always the same, as defined by the scoring system. Adaptation of the Caprini Risk Score to a

specific population may support the individualization of thromboprophylaxis.

Although VTE is far less common in children, some will have conditions that are associated with a relatively high risk for thromboembolic complications. Pedersen et al have performed a systematic review of the literature, and studies that compared pharmacological prophylaxis with no prophylaxis and used diagnostic imaging to verify VTE.⁷ They identified 10 studies that included three categories of pediatric patients—those admitted to the intensive care unit, children with fractures and/or surgery, and children suffering from systemic diseases. Pharmacological thromboprophylaxis was effective when a combination of risk factors was present and it was safe to use.

The incidence of pediatric thromboembolism has a peak in the neonatal period, and the VTE events are most common in the critically ill newborn babies in the intensive care unit. Fort et al provide here a review of the pathophysiology, clinical picture, diagnostic options, and therapy.⁸ They also go into more details regarding the management of two specific conditions—severe protein C deficiency and anti-thrombin deficiency. Finally, outcomes in general as well as thrombosis at unusual sites are reviewed.

The third pediatric review addresses noncritically ill children. Morrison et al describe diagnostic alternatives, management of VTE, and prevention.⁹ Risk stratification for children admitted to hospital needs to be improved. Presence of a central venous catheter is a major risk factor and so is mobility. The management of these hospitalized children with VTE is often complex and multidisciplinary collaboration is beneficial. Local protocols for diagnosis and management of these patients are of paramount importance.

Moving on to the adult population, Schellong et al are here reporting data on isolated distal DVT in comparison with proximal DVT from a registry study with 6,095 patients.¹⁰ The investigators found differences in the demography and risk factors between patients with distal DVT compared with proximal DVT and/or PE. There were also differences in location of diagnosis and initial clinical management. There

Address for correspondence
Sam Schulman, MD, PhD,
Thrombosis Service, HHS-General
Hospital, 237 Barton Street East,
Hamilton, ON, L8L 2 × 2, Canada
(e-mail: schulms@mcmaster.ca).

Issue Theme Recent Advances in
Thrombosis and Hemostasis—
Part VIII; Guest Editor: Sam
Schulman, MD, PhD

© 2022. Thieme. All rights reserved.
Thieme Medical Publishers, Inc.,
333 Seventh Avenue, 18th Floor,
New York, NY 10001, USA

DOI <https://doi.org/10.1055/s-0042-1748886>.
ISSN 0094-6176.

is still uncertainty regarding the need to treat patients with isolated distal DVT with anticoagulation.¹¹

Inferior vena cava thrombosis can obviously have serious consequences but is fortunately relatively rare. Du et al were, despite the low incidence of such thrombotic events, able to review 38 cases treated at their large institution (3,000 beds) with catheter-directed thrombolysis after temporary placement of an inferior vena cava filter.¹² One-quarter of the patients with residual stenosis of at least 50% had also a stent inserted. Subsequently, the patients received rivaroxaban for 6 months and compression stockings for a year. The prevalence of postthrombotic syndrome after 12 months was 18%.

The last three contributions are on the less commonly investigated consequences of VTE, starting with a cohort study on major cardiovascular events after VTE by Noumegni et al.¹³ This was a prospective, multicenter study on almost 5,000 patients, followed for a median of 64 months. The investigators captured major cardiac events in 17.3% and limb ischemic events in 1.7% of the study population. They went on to explore risk factors for these events and some of those were traditional cardiovascular risk factors, whereas others were related to the VTE.

Noumegni et al also performed a meta-analysis of 13 studies to evaluate the risk of cardiovascular death after VTE.¹⁴ The follow-up varied between 1 and 60 months in the studies. Approximately one-third of the recorded deaths was classified as cardiovascular, which was higher than in a population that had not had VTE. These two studies render further support to the concept of links between venous and arterial thrombotic disease.

Finally, we have a letter to the editor from Puteh et al in Malaysia.¹⁵ The authors investigated how cancer-associated thrombosis affects the quality of life in 80 patients treated at the National Cancer Institute, using well-established instruments. Pain and discomfort, male sex, and Eastern Cooperative Oncology Group status (commonly known as ECOG) influenced the quality of life, whereas they did not find a difference between those treated with parenteral anticoagulation versus with direct oral anticoagulants.

I would like to thank all the contributors, representing United States, Denmark, Germany, France, and Malaysia, for rendering this international flair to the theme issue. There should be something of interest here for any of the readers of this journal. And keep in mind that good review manuscripts on new topics around VTE are always welcome!

Conflict of Interest

None declared.

References

- Rabinovich A, Kahn SR. The postthrombotic syndrome: current evidence and future challenges. *J Thromb Haemost* 2017;15(02):230–241
- Guérin L, Couturaud F, Parent F, et al. Prevalence of chronic thromboembolic pulmonary hypertension after acute pulmonary embolism. Prevalence of CTEPH after pulmonary embolism. *Thromb Haemost* 2014;112(03):598–605
- Pugliese SC, Kawut SM. The post-pulmonary embolism syndrome: real or ruse? *Ann Am Thorac Soc* 2019;16(07):811–814
- Konstantinides SV, Vicaut E, Danays T, et al. Impact of thrombolytic therapy on the long-term outcome of intermediate-risk pulmonary embolism. *J Am Coll Cardiol* 2017;69(12):1536–1544
- Schulman S. Recent advances in thrombosis and hemostasis-part VII. *Semin Thromb Hemost* 2021;47(06):621–622
- Krauss ES, Segal A, Dengler N, Cronin M, Pettigrew J, Simonson BG. Utilization of the Caprini Score for risk stratification of the arthroplasty patient in the prevention of postoperative venous thrombosis. *Semin Thromb Hemost* 2022;48(4):407–412
- Pedersen LH, Villadsen GB, Hellfritzsch M, Hvas AM. Prophylaxis of venous thromboembolism in children: a systematic review. *Semin Thromb Hemost* 2022;48(4):413–421
- Fort P, Beg K, Betensky M, Kiskaddon A, Goldenberg NA. Venous thromboembolism in premature neonates. *Semin Thromb Hemost* 2022;48(4):422–433
- Morrison JM, Betensky M, Kiskaddon A, Goldenberg NA. Venous thromboembolism among non-critically ill hospitalized children: key considerations for the pediatric hospital medicine specialist. *Semin Thromb Hemost* 2022;48(4):434–445
- Schellong S, Ageno W, Casella I, et al. Profile of patients with isolated distal deep vein thrombosis versus proximal deep vein thrombosis or pulmonary embolism: RE-COVERY DVT/PE study. *Semin Thromb Hemost* 2022;48(4):446–458
- Kirkilesis G, Kakkos SK, Bicknell C, Salim S, Kakavia K. Treatment of distal deep vein thrombosis. *Cochrane Database Syst Rev* 2020;4(04):CD013422
- Du J, Nie M, Yan Z, et al. Safety and efficacy of rivaroxaban for inferior vena cava thrombosis after successful catheter-directed thrombolysis. *Semin Thromb Hemost* 2022;48(4):459–464
- Noumegni SR, Didier R, Mansourati V, et al. Risk factors for major adverse cardiovascular events and major adverse limb events after venous thromboembolism: a large prospective cohort study. *Semin Thromb Hemost* 2022;48(4):465–480
- Noumegni SR, Grangereau T, Demir A, et al. Cardiovascular mortality after venous thromboembolism: a meta-analysis of prospective cohort studies. *Semin Thromb Hemost* 2022;48(4):481–489
- Puteh SEW, Ibrahim R, Yusak S, Adnan NNN, Ahmat ANMF. Cancer-associated thrombosis: implication toward health-related quality of life. *Semin Thromb Hemost* 2022;48(4):490–496