



OPEN ACCESS

EDITED AND REVIEWED BY
Irena Levitan,
University of Illinois Chicago, United States

*CORRESPONDENCE
Panagiota Anyfanti
✉ panyfan@hotmail.com

RECEIVED 03 October 2025
ACCEPTED 20 October 2025
PUBLISHED 03 November 2025

CITATION
Anyfanti P, Antza C and Kotsis V (2025)
Editorial: Exploring endothelial injury
syndromes: mechanisms, markers, and
therapeutic potential. *Front. Med.* 12:1718272.
doi: 10.3389/fmed.2025.1718272

COPYRIGHT
© 2025 Anyfanti, Antza and Kotsis. This is an
open-access article distributed under the
terms of the [Creative Commons Attribution
License \(CC BY\)](https://creativecommons.org/licenses/by/4.0/). The use, distribution or
reproduction in other forums is permitted,
provided the original author(s) and the
copyright owner(s) are credited and that the
original publication in this journal is cited, in
accordance with accepted academic practice.
No use, distribution or reproduction is
permitted which does not comply with these
terms.

Editorial: Exploring endothelial injury syndromes: mechanisms, markers, and therapeutic potential

Panagiota Anyfanti*, Christina Antza and Vasilios Kotsis

Third Department of Internal Medicine, Papageorgiou Hospital, Aristotle University of Thessaloniki, Thessaloniki, Greece

KEYWORDS

endotheliopathies, endothelial dysfunction, microcirculation, cardiovascular disease, vascular inflammation

Editorial on the Research Topic

Exploring endothelial injury syndromes: mechanisms, markers, and therapeutic potential

The field of endothelial injury syndromes has undergone a significant transformation in recent decades. Initially perceived as a simple anatomical structure, the endothelium is now recognized as a dynamic organ with multifaceted roles in maintaining physiological homeostasis. It is actively involved in regulating coagulation, vascular tone, permeability, and inflammatory responses. When the endothelium is activated, it can lose its integrity, leading to phenotypic changes that trigger procoagulant, pro-inflammatory, and pro-apoptotic mediators (1, 2). This dysfunction is central to a range of hematological conditions and other diseases, including cardiovascular, pulmonary, inflammatory, and tumoral disorders characterized by vascular injury (3–7). Despite the growing attention to endothelial injury syndromes, many questions remain unanswered. There is a need for further research to understand the mechanisms by which endothelial injury contributes to these disorders, develop robust markers for assessing the severity and progression of these syndromes, and explore the endothelium as a potential therapeutic target. Endothelial dysfunction may further serve as a valuable biomarker to guide personalized therapy by identifying patients who are more likely to benefit from targeted interventions.

This Research Topic aimed to explore the multifaceted roles of endothelial injury syndromes in hematology and beyond. Elucidating the mechanisms underlying endothelial injury in various vascular-related disorders will promote the identification and development of endothelial markers for assessing the severity and progression of these syndromes, and ultimately, facilitate the utilization of the endothelium as a therapeutic target. By addressing these objectives, research collected in this Research Topic seeks to advance our understanding of endothelial dysfunction and its implications across different medical specialties. All submitted articles underwent a rigorous peer-review process. Ultimately, ten articles were published.

- (i) In the article by Mitiku et al., prevalence and risk factors of deep vein thrombosis were assessed among hospitalized adults in medical and surgical wards, using a conceptual framework of deep vein thrombosis risk stratification, prevalence of deep vein thrombosis, and various clinical factors.

- (ii) In the contribution by [Xue et al.](#), a case of successful management of late-onset capillary leak syndrome occurring after allogeneic hematopoietic stem cell transplantation was highlighted, employing bevacizumab as a novel therapeutic strategy.
- (iii) Alterations in very-low-frequency oscillations were proposed to reflect endothelial dysfunction and contribute to the development of acute kidney injury among neonates with perinatal asphyxia in the research from [Botero-Rosas et al.](#), further reinforcing the mechanistic link between renal autoregulation, hemodynamic response, and endothelial dysfunction.
- (iv) The role of endothelial dysfunction as a key contributor to the systemic manifestations of chronic obstructive pulmonary disease and a mutual contributor to respiratory diseases and cardiovascular risk was reviewed by [Marcuccio et al.](#)
- (v) A rare case of intravascular papillary endothelial hyperplasia tumor, provided by [Cong et al.](#), further highlights the multifaceted presentation of endothelial injury syndromes.
- (vi) In the article by [Rudakova et al.](#) presenting a single center's real experience on transplant-associated thrombotic microangiopathy, efficacy of eculizumab, a complement inhibitor, was evaluated as a potential promising therapeutic intervention.
- (vii) The role of endothelial glycocalyx in sepsis-induced acute kidney injury was reviewed by [Wang et al.](#), with emphasis on the underlying mechanisms linking endothelial glycocalyx with sepsis-induced acute kidney injury and its potential role as a novel therapeutic target for this potentially life-threatening condition.
- (viii) [Yang et al.](#) constructed a nomogram prediction model with reasonable discriminative capacity for postoperative deep venous thrombosis in arthroplasty.
- (ix) In the study by [Li et al.](#), serum levels of well-acknowledged markers of endothelial dysfunction, including serum levels of nitric oxide, endothelin-1, and vascular endothelial growth factor, were found to predict post-operative femoral neck fractures after cannulated screw fixation in patients with femoral head necrosis.
- (x) In their comprehensive review, [Battistoni et al.](#) provided a critical synthesis of clinical and experimental evidence supporting the notion that direct beneficial effects of glucagon-like peptide-1 receptor agonists on endothelial

function mediate their cardiovascular protection beyond glycemic control.

This interdisciplinary approach encourages collaboration among basic, translational, and clinical researchers from various specialties, including hematology, cardiology, inflammatory and infectious diseases, nephrology, oncology, and transplantation, to facilitate the exchange of new concepts and update state-of-the-art knowledge regarding mechanisms, markers, and therapeutic potential of endothelial injury syndromes.

Author contributions

PA: Writing – original draft, Writing – review & editing. CA: Writing – original draft, Writing – review & editing. VK: Writing – original draft, Writing – review & editing.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that no Gen AI was used in the creation of this manuscript.

Any alternative text (alt text) provided alongside figures in this article has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

1. Gavrilaki E, Anyfanti P. Editorial: endotheliopathies: current concepts and importance in clinical practice. *Front Med.* (2023) 10:1162121. doi: 10.3389/fmed.2023.1162121
2. Battistoni A, Dimitroulas T, Anyfanti P. Editorial: Vascular injury in systemic diseases: current concepts and future perspectives. *Front Cardiovasc Med.* (2025) 12:1656542. doi: 10.3389/fcvm.2025.1656542
3. Anyfanti P, Margouta A, Goulas K, Gavrilaki M, Lazaridou E, Patsatsi A, et al. Endothelial dysfunction in psoriasis: an updated review. *Front Med.* (2022) 9:864185. doi: 10.3389/fmed.2022.864185
4. Anyfanti P, Gavrilaki E, Douma S, Gkaliagkousi E. Endothelial dysfunction in patients with rheumatoid arthritis: the role of hypertension. *Curr Hypertens Rep.* (2020) 22:56. doi: 10.1007/s11906-020-01064-y
5. Gavrilaki E, Anyfanti P, Gavrilaki M, Lazaridis A, Douma S, Gkaliagkousi E. Endothelial dysfunction in COVID-19: lessons learned from coronaviruses. *Curr Hypertens Rep.* (2020) 22:63. doi: 10.1007/s11906-020-01078-6
6. Lamprou S, Koletos N, Mintziori G, Anyfanti P, Trakatelli C, Kotsis V, et al. Microvascular and endothelial dysfunction in prediabetes. *Life.* (2023) 13:644. doi: 10.3390/life13030644
7. Naderi-Meshkin H, Setyaningsih WAW. Endothelial cell dysfunction: onset, progression, and consequences. *Front Biosci.* (2024) 29:223. doi: 10.31083/j.fbl.2906223