

Duffy-null erythrocyte phenotype and the risk of thrombotic events in essential thrombocythemia

Krečak, Ivan; Lucijanić, Marko

Source / Izvornik: *ejHaem*, 2023, 4, 1186 - 1187

Journal article, Published version

Rad u časopisu, Objavljena verzija rada (izdavačev PDF)

<https://doi.org/10.1002/jha2.773>

Permanent link / Trajna poveznica: <https://um.nsk.hr/um:nbn:hr:105:502930>

Rights / Prava: [Attribution 4.0 International](#)/[Imenovanje 4.0 međunarodna](#)

Download date / Datum preuzimanja: **2025-02-23**



Repository / Repozitorij:

[Dr Med - University of Zagreb School of Medicine
Digital Repository](#)



CORRESPONDENCE

Duffy-null erythrocyte phenotype and the risk of thrombotic events in essential thrombocythemia

Dear Editor-in-Chief,

With great interest, we have read the recent article by Karrar et al. [1], published in the *British Journal of Haematology*, which investigated the impact of blood group type on clinical outcomes in patients with essential thrombocythemia (ET). The authors have reported that patients with B-type blood group were more prone to venous thrombosis than patients with other blood groups; this effect was independent of antiplatelet and cytoreductive treatment and was confined to males. We would like to point out that even though ET patients with B-type blood group more frequently received cytoreductive and anticoagulant treatment in comparison to patients with other blood groups (Table 1 in the original article), they suffered from more venous events [1]. This interesting observation deserves a comment and may suggest that other underlying pathophysiological mechanisms could be responsible for the reported phenomenon.

The Duffy blood group system, also known as Duffy antigen receptor for chemokines (DARC), is a highly immunogenic glycoprotein antigen complex located on the surface of erythrocytes, vascular endothelial cells, alveolar epithelial cells, kidney tubular cells, and the Purkinje cells in the brain [2]. Globally, the Duffy-negative phenotype predominates across sub-Saharan Africa [3] and is of particular importance due to its intrinsic resistance to *Plasmodium vivax* infection [4]. DARC also serves as a chemokine receptor decoy; it binds and internalizes different chemokines responsible for leukocyte trafficking and tissue infiltration [2, 5]. In fact, DARC-negative status has been found to be responsible for benign ethnic neutropenia, a chronic congenital form of mild neutropenia (without the tendency for infections) in persons of African, Middle Eastern, and West Indian ancestry [6]. Pathophysiologically, enhanced leukocyte trafficking secondary to DARC absence and high chemokine signaling in the circulation leads to increased tissue sequestration of leukocytes, mostly in the spleen [2, 5]. Finally, through its role in maintaining the inflammatory homeostasis in the organism, DARC may also dampen inflammation-linked carcinogenesis and prevent development and progression of different cancers [5, 7].

We congratulate the authors on providing more insight into the pathogenesis of thrombosis in ET. Indeed, if these results are validated on other datasets, routine testing for blood group type in ET patients

may represent a cheap and easily available test that could help clinicians worldwide to identify patients at high risk of venous thrombosis. We hope that, in the near future, these analyses will also extend to patients with other chronic myeloproliferative neoplasms (MPNs).

As we already mentioned, a significant proportion of ET patients with B-type blood group in the study by Karrar et al. [1] were treated with cytoreduction (83%), antiplatelet (73%), and anticoagulant treatment (48%), calling for other possible explanations for the increased thrombotic risk in this particular subset of patients. Considering that several prior studies have already demonstrated an increased risk of venous thromboembolism in persons with non-O blood types [8–10], we would like to suggest to the authors to analyze whether DARC-negative phenotype may have been associated with higher thrombotic risk in their study [1]. As MPNs are characterized by constitutive leukocyte activation and chronic inflammatory state which are both, at least partly, responsible for the increased thrombotic risk [11, 12], this particular erythrocyte phenotype may accentuate inflammation and increase leukocyte trafficking through vascular endothelium thus having the potential to promote thrombosis in all ET patients not only in those with B-type blood group. We hope that the authors can provide such an analysis.

AUTHOR CONTRIBUTIONS

Both authors conceptualized, wrote, and approved the final version of the manuscript.

CONFLICT OF INTEREST STATEMENT

Both authors declare no conflict of interest.

FUNDING INFORMATION

None.

DATA AVAILABILITY STATEMENT

No data was generated for this article.

ETHICS APPROVAL STATEMENT

The authors have confirmed ethical approval statement is not needed for this submission

This is an open access article under the terms of the [Creative Commons Attribution](https://creativecommons.org/licenses/by/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.



© 2023 The Authors. *eJHaem* published by British Society for Haematology and John Wiley & Sons Ltd.

PATIENT CONSENT STATEMENT

The authors have confirmed patient consent statement is not needed for this submission

CLINICAL TRIAL REGISTRATION

The authors have confirmed clinical trial registration is not needed for this submission.

Ivan Krecak^{1,2} 
Marko Lucijanic^{3,4} 

¹*Department of Internal Medicine, General Hospital of Sibenik-Knin County, Sibenik, Croatia*

²*Faculty of Medicine, University of Rijeka, Rijeka, Croatia*

³*Division of Hematology, University Hospital Dubrava, Zagreb, Croatia*

⁴*Faculty of Medicine, University of Zagreb, Zagreb, Croatia*

Correspondence

Ivan Krecak, General Hospital of Sibenik-Knin County, 22000, Sibenik, Croatia.

Email: krecak.ivan@gmail.com

ORCID

Ivan Krecak  <https://orcid.org/0000-0002-8642-305X>

Marko Lucijanic  <https://orcid.org/0000-0002-1372-2040>

REFERENCES

- Karrar OS, Abdelmagid M, Vannucchi AM, Barbui T, Tefferi A, Gangat N. ABO blood group type and risk of venous thrombosis in essential thrombocythemia. *Br J Haematol.* 2023;202(3), 699–703.
- Meny GM. The Duffy blood group system: A review. *Immunohematology.* 2010;26(2):51–6.
- Howes RE, Patil AP, Piel FB, Nyangiri OA, Kabaria CW, Gething PW, et al. The global distribution of the Duffy blood group. *Nat Commun.* 2011;2:266.
- Langhi DM Jr., Bordin JO. Duffy blood group and malaria. *Hematology.* 2006;11(5):389–98.
- Jinna N, Rida P, Su T, Gong Z, Yao S, LaBarge M, et al. The DARC side of inflamm-aging: Duffy antigen receptor for chemokines (DARC/ACKR1) as a potential biomarker of aging, immunosenescence, and breast oncogenesis among high-risk subpopulations. *Cells.* 2022;11(23):3818.
- Reich D, Nalls MA, Kao WH, Akyzbekova EL, Tandon A, Patterson N, et al. Reduced neutrophil count in people of African descent is due to a regulatory variant in the Duffy antigen receptor for chemokines gene. *PLoS Genet.* 2009;5(1):e1000360.
- Liu XF, Li LF, Ou ZL, Shen R, Shao ZM. Correlation between Duffy blood group phenotype and breast cancer incidence. *BMC Cancer.* 2012;12:374.
- Englisch C, Moik F, Nopp S, Raderer M, Pabinger I, Ay C. ABO blood group type and risk of venous thromboembolism in patients with cancer. *Blood Adv.* 2022;6(24):6274–81.
- Franchini M, Mannucci PM. ABO blood group and thrombotic vascular disease. *Thromb Haemost.* 2014;112(6):1103–9.
- Ohira T, Cushman M, Tsai MY, Zhang Y, Heckbert SR, Zakai NA, et al. ABO blood group, other risk factors and incidence of venous thromboembolism: the Longitudinal Investigation of Thromboembolism Etiology (LITE). *J Thromb Haemost.* 2007;5(7):1455–61.
- Vannucchi AM. To be, or not to be. *Blood.* 2020;135(19):1617–8.
- Hasselbalch HC, Elvers M, Schafer AI. The pathobiology of thrombosis, microvascular disease, and hemorrhage in the myeloproliferative neoplasms. *Blood.* 2021;137(16):2152–60.