



Contents lists available at ScienceDirect

Diabetes & Metabolic Syndrome: Clinical Research & Reviews

journal homepage: www.elsevier.com/locate/dsx

The war in Ukraine and diabetic foot care: Challenges, recommendations



A B S T R A C T

Keywords:

Diabetes
Diabetic foot ulcers
Osteomyelitis
Amputations
Combat medicine
Self - care

Aims: A number of reports have illustrated the barriers that the war in Ukraine puts to diabetes care. While their recommendations are valuable for glycemic control and the prevention or early detection of life - threatening diabetes complications, such as hypoglycemia and ketoacidosis, the discourse on diabetic foot is limited. This letter emphasizes the implications of the war in diabetic foot care and discusses potential solutions.

Methods: The authors searched peer - reviewed and grey literature to identify records related to the prevalence of diabetic foot in Ukraine and the standards of care before and after the invasion of Ukraine.

Results: Thousands of people in Ukraine sustain diabetic foot ulcers and, thus, are at high risk for lower limb amputations due to the limited access to healthcare services in the country. If not addressed, disability associated with chronic ulcers and amputations can severely affect individual and public health in Ukraine. Strengthening primary and remote care, educating people on self - care and providing adequate supplies for the management of diabetic foot have a major potential to prevent amputations, disability and death.

Conclusions: Providing adequate diabetic foot care in Ukraine and other regions tormented by armed conflicts is vital for the health of the local population and the potential of the affected countries to recover after the crisis.

© 2022 Diabetes India. Published by Elsevier Ltd. All rights reserved.

The invasion of Ukraine has put a strain on diabetes care in the country [1]. The management of diabetic foot (DF) under these circumstances has not been discussed yet. The prevalence of DF in Eastern Europe ranges between 2 and 6%, hence 62–185 thousand people in Ukraine sustain DF lesions [2,3]. Amputations' frequency fluctuates between 19 and 39% [4] putting up to 72,000 people in Ukraine at risk of amputation.

Although relevant data from Ukraine has not become available yet, reports from other war-torn countries indicate a notable increase in amputations during armed conflicts. In Syria for instance, approximately 23% of 2653 DF ulcers documented on 1724 patients resulted in an amputation. The follow - up of at least 11% of the patients was discontinued, potentially leading to additional amputations and deaths [5]. In principle, almost half of amputees do not survive more than 5 years [6]. Unsafe surgical procedures can further increase morbidity and mortality. This can condemn families to poverty for years after the war and impede the recovery of the country.

Targeted action for DF care in Ukraine is required. The first step is to ensure that medical supplies for diabetic foot care such as medical dressings, vacuum assisted closure (VAC) devices, local antibiotic preparations, diabetic socks and shoes reach Ukraine and neighboring countries to where refugees head. The second step is to inform - and to the extent possible train - volunteers, peers with diabetes about the signs of DF ulceration and infection,

the need to seek medical attention, and self - care techniques. Raising relevant awareness among healthcare professionals that treat refugees and encouraging them to provide them with prevention and self - care advice and resources is equally important. Finally, yet importantly, teleconsultations can become more effective by utilizing remote DF diagnosis and classification tools that have been developed during the COVID-19 pandemic [7]. The experience from the pandemic suggests that remote DF care can have comparable outcomes with in - person DF monitoring in times of crisis [8].

In Ukraine, uncertainty urges for emphasis on early diagnosis and self - care. Establishing effective telehealth and educating the population about wound prevention and care can contribute to improving DF management in Ukraine for a long time ahead. The right time to collect information about the status of DF care in Ukraine and implement these recommendations is now, because every day lost leads to preventable amputations, disability and death.

References

- [1] Alessi J, Yankiv M. War in Ukraine and barriers to diabetes care. Mar 21:S0140-6736(22)00480-9 Lancet 2022. [https://doi.org/10.1016/S0140-6736\(22\)00480-9](https://doi.org/10.1016/S0140-6736(22)00480-9). Epub ahead of print. PMID: 35325602.
- [2] van Netten JJ, Bus SA, Apelqvist J, et al. Definitions and criteria for diabetic foot disease. Diabetes Metab Res Rev 2020;36(Suppl 1):e3268. <https://doi.org/>

- [10.1002/dmrr.3268](https://doi.org/10.1002/dmrr.3268).
- [3] Pourkazemi A, Ghanbari A, Khojamli M, et al. Diabetic foot care: knowledge and practice. *BMC Endocr Disord* 2020;20(1):40. <https://doi.org/10.1186/s12902-020-0512-y>. Published 2020 Mar 20.
- [4] Costa RHR, Cardoso NA, Procópio RJ, Navarro TP, Dardik A, de Loiola Cisneros L. Diabetic foot ulcer carries high amputation and mortality rates, particularly in the presence of advanced age, peripheral artery disease and anemia. *Diabetes Metabol Syndr* 2017;11(Suppl 2):S583–7. <https://doi.org/10.1016/j.dsx.2017.04.008>.
- [5] Alsabek MB, Abdul Aziz AR. Diabetic foot ulcer, the effect of resource-poor environments on healing time and direct cost: a cohort study during Syrian crisis. *Int Wound J* 2022;19(3):531–7. <https://doi.org/10.1111/iwj.13651>.
- [6] Huang YY, Lin CW, Yang HM, Hung SY, Chen IW. Survival and associated risk factors in patients with diabetes and amputations caused by infectious foot gangrene. *J Foot Ankle Res* 2018;11(1). <https://doi.org/10.1186/s13047-017-0243-0>. Published 2018 Jan 4.
- [7] Hazenberg CEVB, Aan de Stegge WB, Van Baal SG, Moll FL, Bus SA. Telehealth and telemedicine applications for the diabetic foot: a systematic review. *Diabetes Metab Res Rev* 2020;36(3):e3247. <https://doi.org/10.1002/dmrr.3247>.
- [8] Kamaratos-Sevdalis N, Kamaratos A, Papadakis M, Tsagkaris C. Telehealth has comparable outcomes to in-person diabetic foot care during the COVID-19 pandemic. *World J Methodol* 2022;12(4):285–92. <https://doi.org/10.5662/wjm.v12.i4.285>.

Christos Tsagkaris*
Public Health and Policy Working Group, European Student Think
Tank, Amsterdam, Netherlands

Anastasiia Shkodina
Poltava State Medical University, Poltava, Ukraine

Neurological Department, Municipal Enterprise “1 City Clinical
Hospital of Poltava City Council”, Poltava, Ukraine

Lolita Matiashova
Public Health and Policy Working Group, European Student Think
Tank, Amsterdam, Netherlands

L.T. Mala NIT NAMSU, Kharkiv, Ukraine

* Corresponding author. European Student Think Tank, Public
Health and Policy Working Group, Stg European Student Think
Tank, Postjeskade 29, 1058, DE AMSTERDAM, Netherlands.
E-mail address: publichealth@esthinktank.com (C. Tsagkaris).

20 August 2022