frontiers | Frontiers in Endocrinology

ORIGINAL RESEARCH
published: 12 July 2022
doi: 10.3389/fendo.2022.929864

Predicting the Risk of Diabetic Foot Ulcers From Diabetics With Dysmetabolism: A Retrospective Clinical Trial

Mingyang Jiang[1†‡], Fu Gan[2‡], Meishe Gan[3‡], Huachu Deng[4], Xuxu Chen[4], Xintao Yuan[4], Danyi Huang[4], Siyi Liu[4], Baoyu Qin[5], Yanhong Wei[6], Shanggui Su[4] and Zhandong Bo[1*]*

[1] Department of Bone and Joint Surgery, The First Affiliated Hospital of Guangxi Medical University, Nanning, China, [2] Department of Urology Surgery, The Affiliated Hospital of Youjiang Medical University for Nationalities, Baise, China, [3] Department of Endocrinology, The People's Hospital of Baise, Baise, China, [4] Department of Biochemistry and Molecular Biology, Basic Medical College, Guangxi Medical University, Nanning, China, [5] The Endocrine and Metabolic Disease area of Geriatrics, The First Affiliated Hospital of Guangxi Medical University, Nanning, China, [6] Department of Endocrinology, Wuming Hospital of Guangxi Medical University, Nanning, China

Background: Diabetic foot ulcer (DFU) in patients with type 2 diabetes mellitus (T2D) often leads to amputation. Early intervention to prevent DFU is urgently necessary. So far, there have been no studies on predictive models associated with DFU risk factors. Our study aimed to quantify the predictive risk value of DFU, promote health education, and further develop behavioral interventions to reduce the incidence of DFU.

Methods: Data from 973 consecutive patients with T2D was collected from two hospitals. Patients from the Guangxi Medical University First Affiliated Hospital formed the training cohort (n = 853), and those from the Wuming Hospital of Guangxi Medical University formed the validation cohort (n = 120). Independent variable grouping analysis and multivariate logistic regression analysis were used to determine the risk factors of DFUs. The prediction model was established according to the related risk factors. In addition, the accuracy of the model was evaluated by specificity, sensitivity, predictive value, and predictive likelihood ratio.

Results: In total, 369 of the 853 patients (43.3%) and 60 of the 120 (50.0%) were diagnosed with DFUs in the two hospitals. The factors associated with DFU were old age, male gender, lower body mass index (BMI), longer duration of diabetes, history of foot disease, cardiac insufficiency, no use of oral hypoglycemic agent (OHA), high white blood cell count, high platelet count, low hemoglobin level, low lymphocyte absolute value, and high postprandial blood glucose. After incorporating these 12 factors, the nomogram drawn achieved good concordance indexes of 0.89 [95% confidence interval (CI): 0.87 to 0.91] in the training cohort and 0.84 (95% CI: 0.77 to 0.91) in the validation cohort in predicting DFUs and had well-fitted calibration curves. Patients who had a nomogram score of ≥180 were considered to have a low risk of DFU, whereas those having ≥180 were at high risk.

OPEN ACCESS

Edited by:
Ihtisham Bukhari,
Henan Provincial People's Hospital, China

Reviewed by:
Bing Li,
Liuzhou Workers Hospital, China
Zheng Ling,
The First People's Hospital of Yulin, China
Zhixun Zhou,
The People's Hospital of Wuzhou, China
Renbang Huang,
The People's Hospital of Gongcheng Yao Autonomous County, China

***Correspondence:**
Zhandong Bo
drrbozhandong@126.com
Shanggui Su
drrsushanggui@126.com

†ORCID:
Mingyang Jiang
orcid.org/0000-0002-9207-8782

‡These authors have contributed equally to this work

Specialty section:
This article was submitted to Clinical Diabetes, a section of the journal Frontiers in Endocrinology

Received: 27 April 2022
Accepted: 09 June 2022
Published: 12 July 2022

Citation:
Jiang M, Gan F, Gan M, Deng H, Chen X, Yuan X, Huang D, Liu S, Qin B, Wei Y, Su S and Bo Z (2022) Predicting the Risk of Diabetic Foot Ulcers From Diabetics With Dysmetabolism: A Retrospective Clinical Trial. Front. Endocrinol. 13:929864. doi: 10.3389/fendo.2022.929864